ICC Docket No. 00-0812
Verizon Exhibit No. ____

**STATE OF ILLINOIS**

**ILLINOIS COMMERCE COMMISSION**

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| Verizon North Inc. (f/k/a/ GTE North Incorporated) and Verizon South Inc. (formerly known as GTE South Incorporated) | ) | |
| | ) | Docket No. 00-0812 |
| Petition seeking approval of cost studies for unbundled network elements, avoided costs and intrastate switched access services. | ) | |

**SURREBUTTAL TESTIMONY OF**

**DAVID G. TUCEK**

**On Behalf of**

**VERIZON NORTH INC.**
**VERIZON SOUTH INC.**
**(Formerly GTE North Incorporated and GTE South Incorporated)**

**MAY 17, 2002**

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# I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is David G. Tucek. My business address is 1000 Verizon Drive, Wentzville, MO 63385.

**Q. ARE YOU THE SAME DAVID G. TUCEK WHO PREVIOUSLY FILED DIRECT AND REBUTTAL TESTIMONY IN THIS PROCEEDING?**

A. Yes, I am.

**Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY**?

A. The purpose of my surrebuttal testimony is to respond to the rebuttal testimonies of Staff witnesses Koch, Zolnierek, Marshall and Buckley. My surrebuttal testimony also responds to the rebuttal testimonies of IRCA witness Hendricks and AT&T witness Boyles. For all of these witnesses' rebuttal testimonies, my surrebuttal testimony addresses those portions that deal with Verizon's forward-looking cost model, ICM.

**Q. WHAT ATTACHMENTS ARE YOU SPONSORING?**

A. I am sponsoring the following six attachments:

(1) Surrebuttal Attachment DGT-1, "ICM is Flexible Enough to be Modified";

(2) Surrebuttal Attachment DGT-2, "A Typical Digital Switch

Architecture";

(3) Surrebuttal Attachment DGT-3, "States That Have Approved Costs Developed With SCIS";

(4) Surrebuttal Attachment DGT-4, "Variation in Switching Cost per Line Explained by Lines and Technology Choice";

(5) Surrebuttal Attachment DGT-5, "Data Requests Relied on in Tucek's Surrebuttal Testimony"; and,

(6) Surrebuttal Attachment DGT-6, "Response to Staff Data Request JZ 6.1".

As with the data requests listed in Rebuttal Attachment DGT-7, Verizon asks that the requests identified in Surrebuttal Attachment DGT-5 be included as part of the record along with my surrebuttal testimony and other surrebuttal attachments. Because the response to Staff data request JZ 6.1 is voluminous and confidential, it has only been listed in Surrebuttal Attachment DGT-5; the entire response is included in confidential Surrebuttal Attachment DGT-6.

**Q. HOW IS THE REMAINDER OF YOUR SURREBUTTAL TESTIMONY ORGANIZED?**

A. The remainder of my testimony is organized into five major sections. First, I address two major criticisms of ICM that were presented in two or more witnesses' rebuttal testimonies. In particular, I answer the charges (1) that ICM is not flexible, and (2) that switching costs are not usage-sensitive. Second, I point out a common flaw that

many of the criticisms of ICM share. Third, I address specific issues raised by Staff witnesses Koch, Zolnierek, Marshall and Buckley. Fourth, I respond to arguments raised in the rebuttal testimonies of IRCA witness Hendricks and of AT&T witness Boyles. The final section of my surrebuttal testimony summarizes the reasons why the criticisms levied by Staff and other parties are simply not correct and should be disregarded by the Commission.

## II. THE TWO MAIN CRITICISMS OF ICM ARE UNFOUNDED

**Q. WHAT MAIN CRITICISMS RAISED IN THE OTHER PARTIES' REBUTTAL TESTIMONY DOES THIS PORTION OF YOUR SURREBUTTAL TESTIMONY ADDRESS?**

A. There are two. First, several witnesses have claimed that ICM is not flexible enough to be modified to reflect certain changes that they deem to be needed. While Verizon does not agree that all of these proposed changes are warranted, my surrebuttal testimony below shows that it is possible to modify ICM so that most, if not all, of the changes identified by other parties can be implemented. Second, both Mr. Boyles and Mr. Zolnierek have suggested that switching costs are not usage-sensitive. My surrebuttal testimony explains why switching costs are usage-sensitive and provides support for Verizon's use of SCIS and CostMod.

### A. ICM Possesses Sufficient Flexibility to be Modified

**Q. WHAT CRITICISMS OF ICM HAVE OTHER PARTIES MADE, AND HOW CAN ICM BE MODIFIED TO ADDRESS THEM?**

A. Twelve criticisms of ICM are listed in Surrebuttal Attachment DGT-1, along with an explanation of how ICM can be modified to address each one. Note that presenting these criticisms and the corresponding modifications in this attachment does not mean that Verizon believes all of the criticisms are legitimate. In particular, Verizon continues to disagree that the switching inputs to ICM need to be adjusted to hit some target investment per line (Issue (2)), or that ICM's EF&I inputs are too high (Issue (4)). Likewise, Verizon disagrees that the use of one modeled network to estimate switched access LRSICs and another network to estimate UNE TELRICs is inconsistent (Issue (7)). The reasons Verizon disagrees with the other parties on these three issues are outlined in my rebuttal testimony and in my surrebuttal testimony below. Finally, Verizon believes that ICM's use of the C. A. Turner indices (Issue (8)) is correct for the reasons I discuss below.

**Q. WHAT IS VERIZON'S POSITION ON THE OTHER ISSUES LISTED IN SURREBUTTAL ATTACHMENT DGT-1?**

A. With respect to Issue (1), I explained in my rebuttal testimony that ICM does not model a network in which every loop is equipped so that advanced services can be immediately provisioned. Rather, ICM models a network in which provisioning advanced services is not impeded. Additionally, Verizon's filed cost study is based on a 6 mbps transmission speed in order to reflect the FCC's definition of advanced services. (Tucek Rebuttal, pp. 15-16). Even though this transmission speed is

consistent with the Public Utilities Act's definition of advanced services as providing transmission speeds in excess of 200 kilobits per second, Verizon recognizes that determining the modeled transmission speed consistent with the Public Utilities Act is a decision that only the Commission can make. Choosing the 18kf option for the copper loop length will result in a lower modeled transmission speed. Likewise, setting the material and placement costs associated with the 24-line DLCs to zero, further reduces the average transmission speed associated with ICM's modeled network, and addresses the concern that ICM models too many DLCs that are small and underutilized.[1]

With respect to Issue (3), I explained in my rebuttal testimony that no adjustment is needed with respect to the GTD-5, because CostMod does not assign the costs SCIS designates as "getting started" exclusively to call setup. Instead, CostMod assigns costs, including the SCIS "getting started" costs, on the basis of how the underlying switch resources are engineered. I also presented an adjustment to the call setup investments for the 5ESS and Nortel switches that removed the termination portion of the "getting started" costs and reassigned them to the port. (Tucek Rebuttal, pp. 87-88). In my surrebuttal testimony below, I explain further why this is the correct approach to modeling switching costs. Verizon agrees with the adjustment I presented in my rebuttal testimony and show in Surrebuttal Attachment DGT-1, but continues to disagree with Mr. Boyles' recommendation that all of these costs need

[1] At page11 of his rebuttal testimony, Mr. Koch states that the fiber that ICM would model under this modification would be more expensive than the copper cable that actually would be required. I respond to this claim below.

to be removed from call setup or that any adjustment is needed for the GTD-5 switches.

With respect to Issue (5), I explained in my rebuttal testimony what expenses are included in ICM's S/M/A inputs. (Tucek Rebuttal, pp. 76-80). As I explain below, Mr. Boyles does not disagree with my rebuttal testimony. Accordingly, Verizon agrees with the adjustment listed in Surrebuttal Attachment DGT-1. I note that this includes correction of the shortfall inherent in the application of the S/M/A inputs, as well as adjustments deemed appropriate to the development of the inputs.

With respect to Issue (6), I agree with Mr. Boyles that I erred in my calculation of the impact of using an average switch discount for each technology versus a discount that varied by line size and by technology. (Boyles Rebuttal, p. 8). Verizon agrees that the switching inputs for both the switched access and UNE costs should be adjusted to reflect the application of the switch discount by line size and technology.

With respect to Issue (9), Verizon agrees that the ARMIS data that ICM uses as a starting point does not reflect any productivity gains that may have been experienced since 1999. However, the data also do not reflect any inflation that has occurred since 1999. Moreover, even though the order approving the Bell Atlantic / GTE merger explicitly acknowledged that the merger savings would not be realized until three years after the merger was completed, Verizon's adjustment for the merger savings is calculated as if they were realized immediately. Consequently, Verizon

believes that an adjustment to reflect productivity gains from 1999 through 2000 is only warranted if it is accompanied by an adjustment for inflation. Verizon is willing to adjust ICM's inputs to reflect Mr. Zolnierek's proposed 3.3 percent annual productivity offset and an inflation adjustment of 2.27 percent based on the GDP deflator.

With respect to Issue (10), Verizon agrees that the adjustment for skyboxes, sporting events, etc. that I developed in response to Ms. Marshall's request should be used to exclude these expenses if the Commission finds that they are disallowed.

With respect to Issue (11), Verizon continues to believe that selection of the "Shared Costs Included" option is the best way to model these expenses. However, Verizon is willing to concur with Staff's recommendation on this issue provided the fixed-allocator for common costs is modified accordingly.

Finally, with respect to Issue (12), Verizon believes that adjusting costs downward by an amount equal to 50 percent of the expected merger savings is consistent with the order approving the merger – indeed, it is more than consistent since it assumes that the merger savings are immediately realized. Nevertheless, recognizing 100 percent of the savings in the costs while at the same time recovering 50 percent of the savings in rates is also consistent with the merger order. Accordingly, Verizon agrees with the modification listed in Surrebuttal Attachment DGT-1. Note that modification of the fixed allocator would decrease its denominator by an amount

equal to 100 percent of the merger savings and increase its numerator by 50 percent of the merger savings. Also, the resulting fixed allocator may exceed Ms. Marshall's recommended ceiling. Such an outcome would not reflect an increase in Verizon's common costs, but would only reflect a decision to recognize the division of the merger savings via an across-the-board adjustment, rather than by account.

**Q. WOULD THE MODIFICATIONS LISTED IN SURREBUTTAL ATTACHMENT DGT-1 REQUIRE ANY OTHER CHANGES TO VERIZON'S COST STUDY FILING?**

A. Yes. The modifications listed in the attachment all affect the forward-looking direct costs associated with provisioning telecommunications services out of Verizon's Illinois network. Consequently, adoption of the modifications, either singly or in combination, would necessitate a recalculation of Verizon's fixed allocator for common costs. This is consistent with the position espoused by Ms. Marshall at page 9 of her rebuttal testimony.

**Q. WHAT RECOMMENDED CHANGES ARE NOT REFLECTED IN SURREBUTTAL ATTACHMENT DGT-1?**

A. Recommendations that have since been withdrawn or modified by other parties are not included in the Surrebuttal Attachment DGT-1. Among these are Mr. Koch's recommendation that 2000 census data be used to update ICM's customer location inputs and Ms. Marshall's recommendation that an adjustment to account 6722 is required. Also, Mr. Hendricks now proposes that average loop lengths be used in

place of ICM's customer location information. Accordingly, his recommendation that Verizon somehow produce actual customer locations based on addresses is not presented in the surrebuttal attachment.

Similarly, recommendations that are not possible to implement, or that are obviously deficient, are not reflected in Surrebuttal Attachment DGT-1. As I explain below, Mr. Hendricks' average loop length recommendation qualifies for exclusion due to both of these reasons. Mr. Hendricks' recommendations that ICM be modified so that only 80 percent of the loops have copper loop lengths less than or equal to 18kf and that the modeled loops reflect the actual characteristics of the existing network are also not included in the attachment because it is not possible to modify ICM to do so. In any event, the modification listed in conjunction with Issue (1) moves ICM towards both recommendations. Likewise, Mr. Hendricks' recommendation that the option for a 2-pair drop be added to ICM's run time options screen is not listed, because a 2-pair drop is not forward-looking -- Verizon destandardized the 2-pair drop in 1997. (See the file "3wr_drp3.PDF" on the CD containing Verizon's cost study filing.) Also, the modification is not needed because it is possible to model a 2-pair drop already within ICM as I explained at page 66 of my rebuttal testimony.[2] Mr. Hendricks' recommendation that the wire centers sold to Citizen's be eliminated entirely from the cost study filing is not included in the attachment because it is a non sequitur: as I explained in my rebuttal testimony the sold wire centers are not

[2] Because drop placement costs are greater than the corresponding material costs, and because the placement costs would not be changed, substituting a 2-pair drop would have only a minor impact on the 2-wire loop TELRIC.

included in the statewide average costs, and their inclusion or exclusion from the modeled network is totally dependent on the year corresponding to the underlying ARMIS data. (Tucek Rebuttal, p. 32). Finally, Mr. Hendricks' recommendation that ICM be modified so that the depreciation, the cost of money, and the inputs dealing with the percent buried, aerial and underground plant can be changed without importing and exporting files is not included because it is nonsensical. All of these inputs can be modified within ICM without importing and exporting files. I have done so myself with respect to the depreciation and cost of money inputs. With respect to the inputs for percent buried, aerial and underground, there are six values specified for every wire center in the model. This is more than 3,000 individual values – the most efficient way to make changes to such a large number of inputs is to import and export the files.[3]

Finally, I have not included Mr. Zolnierek's suggestion that SCIS and CostMod be abandoned and that all of the switching costs be included in the unbundled UNE port because it is based on the assertion that switching costs are not usage-sensitive. I address this issue in the next section of my surrebuttal testimony.

## B. Switching Costs are Usage-Sensitive

**Q. WHAT ISSUE DOES THIS PORTION OF YOUR SURREBUTTAL**

[3] This particular recommendation, in conjunction with the absence of any testimony indicating that he has ever used ICM suggests to me that Mr. Hendricks is more interested in developing a long list of "recommended" changes rather than identifying those changes that address legitimate concerns.

**TESTIMONY ADDRESS?**

A. In his rebuttal testimony, Mr. Boyles has repeated his assertion that switches are line-constrained. (Boyles Rebuttal, p. 12). Similarly, Mr. Zolnierek continues to assert that Verizon incurs switching costs on a per-line basis. (Zolnierek Rebuttal, pp. 22-26). Mr. Boyles' testimony is intended to support his claim that the getting started costs of a switch should be assigned to the port, while Mr. Zolnierek's testimony is intended to support his recommendation that switching costs be assigned only to the port, and that SCIS and CostMod be abandoned. This portion of my testimony explains why switching costs are usage-sensitive – that is, I explain why the capacity of a switch depends on more than just the number of lines. I also explain why Mr. Zolnierek is wrong when he concludes that Verizon purchases switches on a per-line basis, and I support Verizon's use of SCIS and CostMod. Finally, I address Mr. Zolnierek's comments concerning the regression results I presented in my rebuttal testimony.

**Q. DOES THE CAPACITY OF A DIGITAL SWITCH DEPEND ON MORE THAN JUST THE NUMBER OF LINES?**

A. Yes. It has long been recognized that the capacity of a digital switch is constrained by three parameters: (1) the number of line and trunk terminations; (2) the amount of traffic offered by the terminations; and (3) the processor call rate.[4] This can be understood by considering the architecture of a digital switch as illustrated in Surrebuttal Attachment DGT-2.

[4] Fundamentals of Digital Switching, McDonald, John C., editor, Plenum Press, New York, 1983, pp. 321-322.

**Q. PLEASE EXPLAIN SURREBUTTAL ATTACHMENT DGT-2.**

A. This attachment presents a typical digital switch architecture. Customers whose local loops terminate on the main distribution frame are connected to the switch via line concentration modules (LCMs), which in turn are connected to the rest of the switch by line group controllers (LGCs). Customers served by DLCs or remote terminals are connected to the switch via subscriber carrier modules (SCMs); incoming and outgoing trunks are connected via digital trunk controllers (DTCs) and trunk modules (TMs). The LGCs, SCMs, DTCs and TMs provide the interface between the switching fabric and the line and trunk terminations. The switching fabric consists of the elements that establish the call paths through the switch, whether they are line-to-line, line-to-trunk, trunk-to-line or trunk-to-trunk connections. Call paths are established through the switching fabric by the Central Processor (CP). Besides hunting for and assigning paths for individual calls, the CP provides digit translation and maintains a global picture of all the call paths through the switching fabric. The CP also is used in the activation, operation and deactivation of call features, such as three-way calling. In addition to these components, a digital switch also has peripheral devices associated with disk or tape storage, and with access for maintenance control. Digital switches are scaleable so that a given switch can be engineered with the quantities and sizes of the components needed to serve a given number of lines and trunks based on the offered load.

**Q. WHAT DETERMINES THE REQUIRED QUANTITY FOR EACH OF THE**

**COMPONENTS SHOWN IN SURREBUTAL ATTACHMENT DGT-2?**

A. The number of LCMs are determined by the number of analog lines terminated at the main distribution frame, and by the maximum capacity of the specific vendor's line module. However, the LCMs also provide a concentrating function inasmuch that more analog lines are served by a module than there are paths into the switch. For example, the line module for a given switch may have enough slots for 640 analog POTS lines, but have less than 100 paths available for these lines to communicate with the rest of the switch. The reason for this is that all of the lines served by a given line module will not go off-hook at once. Consequently, if the offered load per line is high enough, the number of lines assigned to a line module may be less than the maximum allowed. The number of LGCs is determined by the number of LCMs, and by the offered load for the analog lines served. The number of SCMs, DTCs and TMs depends on the number of trunks terminating at the switch, whether the far end of the trunk is another switch or a remote terminal. The number of trunks is in turn determined by the offered load, the percent of traffic that is intra-office, and on the amount of concentration in remote terminals.[5] The LGCs, SCMs, DTCs, TMs and the switching fabric are all constrained by the amount of usage that flows through them. The size of the CP depends on the amount of traffic flowing through the switch and on the amount of feature activation. Except for the maintenance control equipment, the peripheral equipment is also dependent on traffic volumes.

**Q. HOW DOES THIS ATTACHMENT RELATE TO MR. BOYLES'**

[5] See Verizon's response to Staff Data Request JZ 1.1.

**TESTIMONY?**

A. Mr. Boyles has framed his argument on getting started costs in terms of whether switches are line- or processor-constrained. (Boyles Rebuttal, p. 12; Boyles Direct, p. 20). In doing so, Mr. Boyles has ignored everything in the switch between the line modules and the central processor. Mr. Boyles' recommendation to assign all of the investment that SCIS identifies as "getting started" costs to the port overlooks the fact that most of the components of a digital switch are usage-sensitive. It is much more consistent with the principle of cost-causation to assign only the getting-started costs associated with line terminations to the port, and to leave the rest assigned to call setup. This is what I have done in my rebuttal testimony. (Tucek Rebuttal, pp. 83-85).

**Q. HOW DOES THIS ATTACHMENT RELATE TO MR. ZOLNIEREK'S TESTIMONY?**

A. Based on his review of the testimony, cost study documentation and data request responses provided by Verizon, Mr. Zolnierek has concluded that Verizon purchases switches on a per-line basis and has consequently recommended that unbundled access to Verizon switches be offered on a per-line basis. He has not proposed the same rate structure for switched access, because the carrier purchasing intrastate switched access does not purchase all of the usage associated with the port. (Zolnierek Rebuttal, pp. 22-26; Zolnierek Direct, p. 28). Setting aside the question of whether or not his conclusion that Verizon purchases switches on a per-line basis is correct, Surrebuttal Attachment DGT-2 demonstrates that the components of a

digital switch are indeed usage-sensitive. Including all of the features and switching in a flat-rate port charge effectively prices the switching and features at zero on the margin to the CLECs. It is reasonable to assume that CLECs purchasing such ports will offer switching and features at low or zero cost to end users in order to differentiate their services. The success of the CLECs' marketing efforts will consequently determine the actual demand on the switch processor and other usage-sensitive switch resources -- if it increases enough, it may well be that a larger processor must be installed or that additions to the switching fabric or controllers will have to be made. To claim that switching costs are not usage-sensitive on the basis of Mr. Zolnierek's review of vendor quotes and contracts ignores the fact that in the real world, switches are engineered on the basis of the offered load.

**Q. IS MR. ZOLNIEREK'S CONCLUSION THAT VERIZON INCURS SWITCHING COSTS ON A PER-LINE BASIS CORRECT?**

A. No. Regardless of what Mr. Zolnierek says, Verizon's cost study filing and the response to Staff data request JZ 6.1 shows that this is not so. For example, the worksheets corresponding to the quote requests for the Lucent model offices require such usage-related inputs as the originating and terminating CCS per line,[6] the percent of intra-office traffic, the line-concentration ratio, and the number of trunks. Also included in this response is a copy of Verizon's engineering procedure that documents application of the Service Ready II (SRII) contract with Nortel. The

[6] CCS (hundred call seconds) is a measure of the load offered to a switching system. For example, five one-minute calls equals 3 CCS (5 calls x 60 seconds = 300 call seconds = 3 CCS).

procedure makes it clear that the model office configurations covered by the contract are based on fixed number of trunks per line consistent with a specified CCS per line. The procedure also allows for the specification of non-SRII trunks, equipment and software. (See, for example, pages 47-52 of the procedure.) Additionally, the portion of the response to JZ 6.1 dealing with the GTD-5's shows the breakdown of the underlying components for each modeled switch. Except for the line modules, all of these components are sized based on the number of required trunks and on the offered load. Mr. Zolnierek has not presented any evidence to support his conclusion that Verizon purchases switches on a per-line basis other than his assessment that "a substantial portion of the price Verizon pays Nortel for switches is determined by line counts and is not usage-sensitive." (Zolnierek Rebuttal, p. 25). In making this assessment, Mr. Zolnierek overlooks the fact that the model office configurations upon which the SRII contract is based assumed a specified CCS per line and that the purchase of equipment above and beyond this configuration may be required. He has also overlooked the fact that the vendor quotes for the GTD-5 contained in the cost study filing vary by both the lines equipped and by the line-to-trunk concentration assumed.[7] This demonstrates again that the vendor pricing is not based solely on lines.

**Q. SHOULD THE COMMISSION ACCEPT MR. ZOLNIEREK'S**

[7] In his response to Verizon data request VZ-STAFF 4.06, Mr. Zolnierek claims that there is a unique mapping between the vendor quotes and the number of lines for each switch technology, and that this mapping constitutes a discrete function between costs and lines for each technology. This is obviously not true for the quotes provided for the GTD-5. Moreover, Mr. Zolnierek's response to this data request is myopic in that it ignores the information I listed above that shows that switch costs are not solely determined by line size.

**RECOMMENDATION THAT SCIS AND COSTMOD BE ABANDONED?**

A. No. The costs underlying the rates that Mr. Zolnierek would base his alternative switched access proposal on (Zolnierek Direct, p. 4) were developed using CostMod and SCIS, so his recommendation to abandon SCIS and COSTMOD is inconsistent with this proposal. In addition, switching costs developed with SCIS and CostMod have been approved by other state commissions for both Verizon and for other companies. Surrebuttal Attachment DGT-3 is a partial list of dockets in which costs based on SCIS have been approved in various states for Verizon, Sprint and BellSouth. Note that the two Verizon dockets in Michigan and North Carolina also included costs developed with CostMod. Additionally, in FCC Docket 92-91, SCIS was subjected to an independent audit conducted by Arthur Andersen. In its report, Arthur Andersen reached the following conclusions:

- The costing principles inherent in SCIS are appropriate for estimating long run incremental investments attributable to switching system usage, and the specific methods for implementing these principles are reasonable.

- SCIS accurately estimates the cost of actual switching systems engineered according to manufacturer engineering rules as evidenced by Bellcore's validation procedures and results.

- Extensive software development controls and testing are used to assure SCIS models are properly implemented and installed by model users.

- Finally, although SCIS is a complex model requiring considerable understanding of switching systems and service costing, the model documentation, training and technical support are adequate to provide reasonable support for the model in use.

(Arthur Andersen, *Independent Review of SCIS /SCM Report*, July, 1992; p. 7).

Mr. Zolnierek's recommendation that SCIS and CostMod be abandoned is based on his incorrect conclusion that Verizon incurs switching costs on a per-line basis, and should therefore be ignored for this reason as well. Further, because both of these models have been accepted by other state commissions and because both models estimate switching costs based on the manner in which digital switches are designed, the Commission should accept their use in the development of Verizon's costs for unbundled switching and switched access.

**Q. MR. ZOLNIEREK CLAIMS, AT PAGE 22 OF HIS REBUTTAL TESTIMONY, THAT YOUR INTERPRETATION OF YOUR REGRESSION RESULTS "IS ERRONEOUS." HAS HE DEMONSTRATED THIS IN HIS REBUTTAL TESTIMONY?**

A. No. He merely reiterates his assertion that the price Verizon pays for switches is determined only by lines, and then suggests two possible explanations for the observed regression results. First, he suggests that I "might have misinterpreted the regression results" by raising the possibility that some other functional form exists between the per-line switching costs and the number of lines and technology type. Second, he suggests that SCIS and CostMod may have manipulated costs in such a way so that the relationship with lines and technology choice is somehow distorted. (Zolnierek Surrebuttal, pp. 23-24). Mr. Zolnierek has offered nothing but suggestions of these possibilities to support his claim concerning the regression results. In particular, in response to Verizon's data requests VZ-STAFF 4.08 and VZ-STAFF 4.09, Mr. Zolnierek stated that he has not tested the regressions that I presented in my rebuttal testimony, nor has he tested any regression equations relating switching costs to lines or any other variable. Also, Mr. Zolnierek's latter "possibility" is contradicted by the second finding of the Arthur Andersen report cited above. His suggested "possibility" begs the question as to why SCIS and CostMod have been accepted for use in other jurisdictions, and why SCIS continues to be a commercially viable product for Telcordia.

**Q. HAVE YOU REVIEWED THE REGRESSION RESULTS WITH RESPECT TO MR. ZOLNIEREK'S FIRST "POSSIBILITY"?**

A. Yes. I ran six additional regressions for both the base unit and remote switches. Three of these regressions replaced the linear term for lines with (1) lines squared, (2) the square root of lines, and (3) the natural logarithm of lines. The remaining

three regressions added the linear term for lines to each of the first three equations. The resulting R-squared statistics for each of these estimates are presented in Surrebuttal Attachment DGT-4. For both the base units and the remotes, the R-squared for the estimates using the logarithm of lines is higher than the results reported in my rebuttal testimony.

**Q. DOES THE INCREASE IN THE R-SQUARED MEASURE PROVE THAT SWITCHING COSTS ARE NOT USAGE-SENSITIVE?**

A. No. First, more than 20 percent of the variation in cost per line remains unexplained for the base units. For the remotes, almost 30 percent of the variation is unexplained. More important, because switches are engineered on the total load offered, and because total load depends on both the number of lines and the usage per line, it is not surprising that there is a correlation between costs and lines. It is likely that the introduction of the nonlinear lines term is picking up the effect of other phenomena. For example, other things being equal, one would expect large switches to experience more intra-switch calling than smaller switches. The mix between intra- and interswitch calls is another usage-related factor that influences the cost of a switch, since it affects the number of trunks. This explanation is supported by the signs of the estimated coefficients in the equations with both a linear and nonlinear lines term. For every specification except for the one involving both the lines and lines squared terms, the coefficient for the nonlinear lines term is negative. For the exception, the coefficient for the linear lines term is negative for both the base units and remotes. Consequently, the new regression results do not prove that switch costs

are not usage sensitive. To the contrary, the results are consistent with how switches are engineered and support the conclusion that switch costs are, in fact, usage-sensitive.

## III. ARGUMENTS THAT ICM'S COSTS ARE TOO HIGH SUFFER FROM A COMMON FLAW

**Q. WHAT DOES THIS PORTION OF YOUR SURREBUTTAL TESTIMONY ADDRESS?**

A. In their rebuttal testimonies, many of the parties have reiterated arguments supporting the conclusion that ICM's estimated costs are too high. For example, Mr. Hendricks has repeated his claim that ICM models an overly expensive network, and Mr. Zolnierek criticizes ICM for not accounting for growth in demand. (Hendricks Rebuttal, p. 10; Zolnierek Rebuttal, p. 20). While the individual criticisms underlying these claims are deficient in their own right, they all suffer from a common flaw. Specifically, they ignore a substantial amount of evidence that indicates ICM produces cost estimates that are below the forward-looking costs of provisioning unbundled network elements and switched access services out of Verizon's Illinois network.

**Q. WHAT EVIDENCE INDICATES THAT ICM PRODUCES COST ESTIMATES THAT ARE BELOW THE FORWARD-LOOKING COSTS OF PROVISIONING UNBUNDLED NETWORK ELEMENTS AND SWITCHED**

**ACCESS SERVICES OUT OF VERIZON'S ILLINOIS NETWORK?**

A. I listed several reasons in my direct testimony explaining why ICM's estimated costs must be viewed as a lower bound on the forward-looking costs of provisioning telecommunications services out of Verizon's Illinois network. They are worth repeating here.

First, because ICM models the network as if it is built all at once, ICM assumes economies of scope and scale that do not exist in the real world. This can be seen by considering the following comparisons between ICM and the real network:

(1) unless the maximum cable size is exceeded, ICM does not model multiple sheaths along a route even though multiple sheaths occur in the real world for other reasons;

(2) ICM assumes pole lines run down only one side of the street, whereas in the real network, clearance considerations may require poles on both sides;

(3) in ICM, pair-gain devices are assumed to be located in the center of a carrier serving area, while in the real network, they may be located elsewhere due to topographical and right-of-way constraints, or due to the development of demand through time;

(4) ICM provisions one pedestal for every four drops, when in the real network some pedestals will serve fewer drops simply because there isn't always an even number of customer locations on a street; and,

(5) in ICM, distribution plant is built only to serve existing customers, whereas in the real network plant is also built to serve both vacant and planned structures.

Second, the assumptions underlying ICM do not reflect the constraints that Verizon will face over the next few years. In particular, ICM does not account for the costs of transitioning the existing network to the network contemplated by the model, or even to the network required in a UNE environment. For example, in Verizon's existing network, many end users are served by integrated pair-gain devices because this is the most economical way of providing service. If such an end user decides to leave Verizon in favor of a CLEC, and if the CLEC only orders an unbundled loop from Verizon, then Verizon must terminate the end user's loop at the mainframe in order to hand it off to the CLEC. This will often be accomplished by transferring the end-user's loop from the remote terminal to an existing copper facility, and terminating that loop via a D4 channel bank in the central office. Because ICM assumes all new plant and technology, it does not capture these transition costs.

**Q. ALL OF THESE EXAMPLES DEAL WITH OUTSIDE PLANT. ARE THERE REASONS WHY THE SWITCHING COSTS PRODUCED BY ICM SHOULD**

**BE VIEWED AS A LOWER BOUND?**

A. Yes. In my rebuttal testimony, I explained that ICM's Investment Adjustment Factor (IAF) is used to incorporate the pricing for switch additions into the switching costs used by the model. (Tucek Rebuttal, p. 72). Briefly, the IAF input equals the initial switch cost plus the present value of the cost of line additions over a six-year time frame, divided by the initial switch cost. This approach to incorporating the pricing for switch additions into ICM's switching inputs understates the current cost of switching that Verizon experiences, for three reasons.

First, ICM estimates the per-MOU LRSICs and TELRICs based on 365 days per year. In other states, Verizon typically uses 251 equivalent business days per year. In New Jersey, WorldCom witness August Ankum proposed 308 days. (Rebuttal Testimony of Dr. August H. Ankum, p. 5, New Jersey Docket No. TO00060356). ICM's use of 365 days results in lower costs than if either of these two lower values were used.

Second, Verizon's network in Illinois is already 100 percent digital, so that new switch purchases will be a rare occurrence compared to the total number of wire centers, and will likely be limited to remotes. The same is true for the rest of Verizon's network, since all but 4 switches are digital.[8] As a consequence, the initial switch pricing is not representative of the pricing Verizon will obtain going forward,

[8] Indeed, based on ARMIS data for 2001, there are only 139 analog switches in the combined networks of BellSouth, Qwest, SBC and Verizon. The remaining 14,158 switches are digital, and serve more than 96.5 percent of companies' combined access lines.

and ICM's heavier weighting of the initial switch pricing causes ICM's results to understate Verizon's forward-looking costs.

Finally, and most important, because Verizon's switch vendors have little expectation of selling new switches, the pricing for additions is more representative of the revenue streams that the vendors require in order to sustain themselves, or the product line, as a going concern.[9] Consequently, even though the model makes the assumption that the network is built all at once, it is not realistic to assume that vendors would be able to offer so many new switches at the modeled initial switch prices. Again, the consequence is that ICM's heavier initial switch weighting causes the resulting cost estimates to be understated.

**Q. WHY IS THE ABOVE DISCUSSION RELEVANT TO THE DECISION FACING THE COMMISSION?**

A. Even before the adjustments listed in Surrebuttal Attachment DGT-1 can be considered, the Commission must decide whether to accept or reject ICM as a basis for determining Verizon's forward-looking costs. Several parties have recommended that the Commission reject ICM. In making this recommendation, they have focused only on the perceived flaws which, in their judgement, cause ICM to produce costs that are too high. They have failed to consider, for the reasons outlined above, that there is a downward bias in the results produced by the model.

[9] Also, to the extent that one of the Commission's objectives is to set rates that signal the incremental costs of the underlying resources, then the pricing of switch additions is clearly more appropriate than the initial switch pricing.

Consequently, the arguments that unit costs will decline as demand increases, or that ICM overbuilds the modeled network, turn a blind eye to the fact that ICM's cost estimates are understated to begin with. In deciding whether to accept or reject ICM, the Commission should not only consider whether a specific criticism is justified and, if so, whether some modification to ICM is a sufficient remedy. The Commission should also consider whether or not the broad charge that ICM's costs are "too high" is valid. I believe the charge is unjustified, not only because the individual criticisms upon which it is based are without merit, but also because ICM's costs are biased downward.

## IV. THE OTHER STAFF CRITICISMS ARE UNFOUNDED

### A. Mr. Koch's Testimony

**Q. WHAT PORTIONS OF MR. KOCH'S REBUTTAL TESTIMONY DOES THIS SECTION OF YOUR SURREBUTTAL ADDRESS?**

A. This portion of my surrebuttal testimony addresses the following:

(1) Mr. Koch's opposition to Verizon's use of the C. A. Turner indices (Koch Rebuttal, pp. 3-4);

(2) Mr. Koch's criticism of my comparison of ICM with the costs underlying Verizon's existing local loop rates (Koch Rebuttal, pp. 5-8); and,

(3) Mr. Koch's continued criticism of ICM's modeled network (Koch Rebuttal, pp. 9-17).

**Q. WHAT IS THE BASIS FOR MR. KOCH'S OPPOSITION TO THE USE OF THE C. A. TURNER INDICES?**

A. Mr. Koch's sole basis for opposing use of the C. A. Turner indices is the FCC order that he quotes at page four of his rebuttal testimony. The reasoning in the order is flawed, since it is based on a preference for indices developed for broad sectors of the economy, and that are used by a large number of companies. It rejects the C. A. Turner index because it is narrowly focused and used by a small number of users. The FCC's reasoning is flawed for two reasons.

First, a narrowly-focused set of indices is what is required in this instance. To be useful, the indices must be tailored to the industry and to the plant types whose reproduction cost they measure. The standard of a broadly-based index required by the FCC and embraced by Mr. Koch is nonsensical. There is no alternative broadly-based index that reflects just the cost components underlying the construction of telephone plant – if such an alternative index existed, then it would not be broadly-based.

Second, the complaint that the indices are used by only a handful of users is also without merit. The number of companies using the indices is, of course, constrained by the number of companies in the industry. It would not be reasonable to require that such indices be used by companies that have no telephone plant.

**Q. WHAT ABOUT THE FCC'S AND MR. KOCH'S CONCERNS THAT THE INDICES ARE NOT VERIFIABLE?**

A. I do not know for certain what the FCC and Mr. Koch mean by "verifiable" – presumably it means the ability to construct the indices given the same raw data that AUS Consultants used. This is not a reasonable requirement, since both the data and the resulting indices are the intellectual property of AUS. Moreover, there is no reason to believe that AUS is not capable of adequately constructing telephone plant indices. AUS has an active valuation practice with customers as diverse as AT&T and IBM. In any event, as I note below in my discussion of Ms. Marshall's testimony, the calculations underlying Verizon's use of the indices have been provided with Verizon's cost study and are available for verification by Staff or any other party.

**Q. HAVE ANY WITNESSES FOR AT&T EVER RELIED ON THE C. A. TURNER INDICES?**

A. Yes. In Florida Docket No. 990469A-TP, AT&T witness Brian F. Pitkin relied on the C. A. Turner indices in his analysis of the costs presented by BellSouth. In justifying his use of the indices, he testified as follows:

> And I believe BellSouth likely has a copy of the C. A. Turner Telephone Plant Index. It's a very common source used in the industry. (Florida Docket No. 990649A-TP; Deposition of Brian F. Pitkin; January 18, 2002; p. 26).

**Q. SHOULD THE COMMISSION ACCEPT MR. KOCH'S RECOMMENDATION THAT THE C. A. TURNER INDICES NOT BE RELIED ON?**

A. No. Mr. Koch's recommendation is based solely on the flawed reasoning of the FCC and should be rejected by the Commission. Additionally, neither Mr. Koch nor any other party has offered a viable alternative to the C. A. Turner indices. In particular, as I explain below, Ms Marshall's suggestion that the carrying cost of Verizon's general support assets be based on book cost instead of reproduction costs is contrary to the Commission's cost study rules.

**Q. PLEASE COMMENT ON MR. KOCH'S CRITICISM OF YOUR COMPARISON OF ICM WITH THE COST STUDY UNDERLYNG VERIZON'S LOCAL RETAIL RATES.**

A. Mr. Koch agrees with the first two adjustments I made to ICM in order to make it comparable to the cost study underlying Verizon's retail rates for local exchange service. He excludes the third adjustment because he believes that it was made solely to remove the DLC investment modeled by ICM since this investment was not included in the earlier study. (Koch Rebuttal, p. 6). He is incorrect in his belief. As I stated in my rebuttal testimony at page 10, "by excluding loops served by DLCs from the calculated average and selecting ICM's 18kf option, it is possible to eliminate the circuit equipment investment associated with the loop from the current study, *and to mirror the population from which sampled loops were drawn*."

(Emphasis added.) It is true, as Mr. Koch claims at page 7 of his rebuttal testimony, that this adjustment excludes the longest loops in ICM's modeled network. However, this exclusion is necessary in order to mirror the population from which the earlier study's sample was drawn. The loop sample excluded long loops served by DLCs via fiber feeder and, in the case of pair-gain devices that may have been served with copper feeder, the sample truncated the loop length at the pair gain device. In response to IRCA data request 5.04(b), I explained how ICM's 18kf option mirrored the population from which the sample was drawn, even though none of the sampled wire centers had an average loop greater than 12 kilofeet:

> The fact that none of the offices had an average loop length greater than 12,000 feet does not mean that loops greater than 12,000 feet did not exist in the office. Selecting ICM's 18kf option produces a network in which copper loops in excess of 12kf and not served by DLCs exist. This mirrors the population from which the sampled loops were drawn to the greatest extent possible.

Apparently, Mr. Koch had not reviewed the response to this data request when he wrote his rebuttal testimony.

**Q. HAS MR. KOCH OVERLOOKED AN IMPORTANT PART OF THE COMPARISON YOU MADE IN YOUR REBUTTAL TESTIMONY?**

A. Yes. At pages 7-8 of his rebuttal testimony, he claims that I failed to include the

port in the ICM results that I compared to the existing retail rates. In making this claim, he has overlooked page 11 of my rebuttal testimony were I stated that it was necessary to include the $1.50 port cost that was consistent with the adjustments made to ICM for purposes of this comparison. In adding the filed port cost of $2.18, Mr. Koch has failed to consider the impact of these adjustments on the resulting port TELRIC.

**Q. IS MR. KOCH'S CONCLUSION, AT PAGE 8 OF HIS REBUTTAL TESTIMONY, THAT ICM SIGNIFICANTLY INFLATES COSTS WARRANTED?**

A. No. He bases his conclusion on his truncated modifications of ICM. This is inconsistent with what he has already acknowledged, namely, that the modified ICM costs used in this comparison should exclude the DLC investment. Moreover, the objective of the three adjustments presented in my rebuttal testimony was not to correct any real or imagined flaws in ICM. The objective was to demonstrate the flaw in Mr. Koch's and Mr. Hendricks' comparison of ICM's costs with the existing loop rates, and in their conclusion that ICM modeled an overbuilt network. The only way to do this is to modify ICM so that it mimics the earlier study -- all three of the adjustments I presented in my rebuttal testimony are needed to accomplish this. Stopping at only two as Mr. Koch suggests does not provide any meaningful information to the Commission. Mr. Koch has not presented a sufficient argument to support his comparison of ICM's costs with the existing retail rates.

**Q. WHY DOES MR. KOCH CONTINUE TO DISAGREE WITH THE NETWORK MODELED BY ICM?**

A. Mr. Koch continues to maintain that ICM models too many DLCs and also models the wrong DLCs. In reiterating the first of these positions, Mr. Koch has not presented any new evidence or arguments other than his concern over the use of the C. A. Turner indices. He fails to consider, for example, that the Commission's rules require that costs be modeled as if the service were being offered for the first time. (Part 791.20(c)) At a minimum, this requires that the copper portion of the loop be restricted to 18 kilofeet, in order to comply with the Revised Resistance Design (RRD) standard used to lay out local loops on a wire-center wide basis. (Tucek Rebuttal, p. 16). Consequently, while Mr. Koch may believe that ICM is overbuilt because it models too many DLCs under the 12-kilofoot copper loop restriction, he cannot credibly hold that this is the case for the 18-kilofoot option. As shown on page 2 of Rebuttal Attachment DGT-1, ICM's modeled circuit equipment investment is almost 50 percent below either the reproduction cost or the book cost of this equipment.[10] Additionally, for the 18-kilofoot option, only 0.03 percent of the lines are served by DLCs with 5 or fewer lines. Again, these results are not consistent with Mr. Koch's assertion that too many DLCs are modeled.

**Q. WHY DOES MR. KOCH BELIEVE THAT ICM MODELS THE WRONG DLCS?**

[10] Mr. Hendricks has complained that the circuit equipment account contains more than just DLC investment. (Hendricks Rebuttal, p. 8). He is correct; besides including the cost of similar equipment used in the transport network, the account also includes the investment in loop extenders such as load coils that ICM does not model because of its compliance with the RRD standard. ICM has correctly substituted

A. Mr. Koch seems to have assigned too much emphasis on the advanced-services capability of the DLCs modeled by ICM.[11] As I explained in my rebuttal testimony, all this capability means is that the modeled network does not impede the provision of advanced services – the cost of the additional equipment needed to provide advanced services is not included in ICM's modeled investment. (Tucek Rebuttal, p. 34). In focusing on this aspect of the modeled DLCs, Mr. Koch overlooks two important facts. First, Verizon is purchasing the DLCs modeled by ICM for use in its network today. By comparison, the SLC-96 that Mr. Koch puts forth as a forward-looking, "traditional" DLC (Koch Rebuttal, p. 15) is no longer manufactured. Second, the GR-303 interface provided by ICM's NGDLCs is more efficient. For one thing, it allows for greater concentration on the DS-1 links that connect the DLC to the central office. Consequently, ICM's use of NGDLCs is more efficient than the "traditional" DLCs espoused by Mr. Koch.

**Q. AT PAGE 16 OF HIS REBUTTAL TESTIMONY, MR. KOCH CLAIMS THAT ZEROING OUT THE LABOR AND PLACEMENT COSTS ASSOCIATED WITH THE SMALLEST DLC WILL STILL OVERSTATE COSTS BECAUSE FIBER IS PLACED INSTEAD OF COPPER. IS HE CORRECT?**

A. No. Mr. Koch has failed to realize that the placement cost of fiber and copper is

DLCs and fiber for copper and load coils.

[11] At page 14 of his rebuttal testimony, Mr. Koch states that he responded to Verizon data request VZ-STAFF 1.04 by providing a definition of NGDLC from Newton's Telecommunications Dictionary without "altering it in any way". I subsequently confirmed with Mr. Koch that he did, indeed, paraphrase the definition in his response to the data request. However, his paraphrasing of the definition does not materially distort it.

essentially the same, so that modeling fiber instead of copper is a wash as far as placement costs are concerned. He has also failed to realize that the material cost of fiber is lower than copper except for the 25-pair cable. Additionally, if the DLC inputs are zeroed out, ICM will not model any SAIs that might be required if it placed copper instead of fiber to connect these customers to the next DLC. Consequently, in terms of material costs, modeling copper would result in higher costs than those reported in my rebuttal testimony. In other words, the $1.23 and $0.37 differentials (corresponding to the 12- and 18-kilofoot options, respectively) that I reported in my rebuttal testimony overstate the impact of modeling the 24-line DLC.

## B. Mr. Zolnierek's Testimony

**Q. WHAT PORTIONS OF MR. ZOLNIEREK'S REBUTTAL TESTIMONY DOES THIS SECTION OF YOUR SURREBUTTAL ADDRESS?**

A. My surrebuttal testimony addresses the following portions of Mr. Zolnierek's rebuttal testimony:

(1) his claim that my rebuttal testimony is inconsistent (Zolnierek Rebuttal, pp. 8-9);

(2) his claim that ICM is not company-specific (Zolnierek Rebuttal, pp. 10-11);

(3) his renewed claim that ICM's costing methodology is inconsistent (Zolnierek Rebuttal, p. 11);

(4) his standard for gauging the flexibility and openness of a cost model (Zolnierek Rebuttal, pp. 12-13); and

(5) his concern that Verizon may over- or under-recover its costs (Zolnierek Rebuttal, p. 20).

**Q. WHY DOES MR. ZOLNIEREK BELIEVE YOUR REBUTTAL TESTIMONY IS INCONSISTENT?**

A. Mr. Zolnierek claims that my argument that the Commission's rules require that technology that is not planned for deployment not be modeled is inconsistent with basing ICM's loop costs on a network that Verizon will never build. In making this claim he has incorrectly equated the network modeled by ICM with a "technology". The truth of the matter is that every technology in ICM's modeled network is deployed in Verizon's real network. By comparison, the SS7 Gateway suggested by Mr. Zolnierek is a technology that Verizon has not deployed, and does not plan to deploy, in its network. The network modeled by ICM is not a "technology" and the inconsistency alleged by Mr. Zolnierek does not exist.

**Q. WHY DOES MR. ZOLNIEREK BELIEVE ICM IS NOT COMPANY-SPECIFIC?**

A. Mr. Zolnierek bases this claim on my acknowledgement that the network modeled by ICM will never be deployed by Verizon in Illinois. The reason that the network modeled by ICM will never be deployed is that Verizon is not going to rebuild its network from scratch as is assumed by the model. This does not mean that the

resulting costs cannot be used as estimates of the forward-looking economic costs of provisioning telecommunications services out of Verizon's Illinois network. As I explained in my direct testimony and above, one must view the modeled costs as lower bound on Verizon's forward-looking costs – this does not make them any less useful, nor does it mean they are not company-specific. In particular, because ICM is based on Verizon-specific material and placement costs, Verizon-specific expense inputs, and on Verizon's actual wire center locations, line counts and switch types, it is clear that ICM is company-specific.

**Q. DOES MR. ZOLNIEREK UNDERSTAND WHY ICM ASSUMES A DIFFERENT NETWORK CONFIGURATION FOR UNES THAN IT DOES FOR THE LRSICS FOR SWITCHED ACCESS?**

A. I don't believe he does. The differences in the two assumed networks relate only to the loops served by DLCs. When such loops are used to serve a retail customer, they are terminated on the trunk side of the switch. Such a configuration is said to be integrated and is designated by the acronym IDLC – "Integrated Digital Loop Carrier". It is not possible to unbundle an IDLC loop, since by definition an unbundled loop must terminate at the CLEC collocation space. In the real world, retail loops that are served via IDLC are unbundled in one of two ways. Either they are terminated in a central office terminal (COT) in what is known as a Universal Digital Loop Carrier (UDLC) configuration, or they are transferred to copper facilities and terminated in a D4 channel bank. ICM models the cost of an unbundled loop by assuming the UDLC configuration for all loops. This assumption

underestimates costs because it takes advantage of the already existing fiber link between the DLC and the office, thereby eliminating the cost of any copper feeder facilities that might actually be used. It also underestimates costs because it assumes the maximum possible fill on the COTs in the wire center. For the switched access filing, ICM assumes such lines are terminated on the trunk side of the switch using IDLC because that is how such loops would be provisioned when they are not unbundled. Because some of these loops will be unbundled in the real network and not provisioned with IDLC, ICM's resulting DS-1 port utilization will be greater than what can be actually realized, causing the modeled trunk port LRSICs to be understated.

**Q. HAS MR. ZOLNIEREK PRESENTED A REASONABLE STANDARD FOR GAUGING THE FLEXIBILITY AND OPENNESS OF ICM?**

A. No. He has correctly identified the three basic ways that a user can alter ICM, but seems to suggest that the third method – modification of ICM's code – is not satisfactory and that any change ordered by the Commission must be accomplished by changing model inputs. (Zolnierek Rebuttal, p. 12-13). Such a standard is not reasonable, since every model consists of more than just inputs. Mr. Zolnierek has acknowledged this himself, since he states that the tiered structure he identifies for affecting changes "is a natural byproduct of any cost model." (Zolnierek Rebuttal, p. 13).

**Q. HAS ANY STATE COMMISSION ESTABLISHED GUIDELINES**

**CONCERNING THE OPENNESS AND FLEXIBILITY OF COST MODELS?**

A. Yes. The Florida Public Service Commission has ruled that BellSouth is not required to provide other parties access to the source code underlying their model, and that the fact that BellSouth provided its source code only in PDF form did not hinder AT&T's and MCI WorldCom's analysis of the model. (Order, Florida Docket No. 990649-TP; May 25, 2001; p. 152). Verizon has exceeded this standard because ICM's source code has been provided in both text file and PDF form.

**Q. PLEASE COMMENT ON MR. ZOLNIEREK'S CONCERN THAT VERIZON MIGHT OVER- OR UNDER-RECOVER ITS SWITCHING COSTS.**

A. Mr. Zolnierek's concern is misplaced – the issue of cost recovery is a rate-design issue. Verizon's forward-looking costs do not necessarily correspond to actual costs, either individually or in the aggregate. As Ms. Marshall has testified, the "determination of appropriate rates may include other factors in addition to Verizon's forward-looking costs." (Marshall Rebuttal, p. 6). Nevertheless, the unit costs produced by SCIS and CostMod are the best available estimates of Verizon's forward-looking switching costs because their assignment of costs between termination and usage reflects how switches are actually engineered, and because the line, trunk and usage inputs are based on Verizon's actual network in Illinois. As I noted earlier, the switching cost estimates produced by ICM represent a lower bound on Verizon's forward-looking, economic costs because 365 average business days is assumed, and because the switch costs are heavily weighted to the pricing for initial switch placements rather the switch additions.

852

853 **C. Ms. Marshall's Testimony**

854

855 **Q. WHAT PORTIONS OF MS. MARSHALL'S REBUTTAL TESTIMONY DOES**
856 **THIS SECTION OF YOUR SURREBUTTAL ADDRESS?**

857 A. My surrebuttal testimony addresses the following portions of Ms. Marshall's rebuttal
858 testimony:

859 (1) her repeated claim that ICM does not comply with the Commission's
860 administrative rules for cost studies (Marshall Rebuttal, pp. 2-3);

861 (2) her claim that my rebuttal testimony is inconsistent (Marshall Rebuttal,
862 p. 4);

863 (3) her claim that Verizon should use forecasted demand data to develop its
864 forward-looking TELRICs and LRSICs (Marshall Rebuttal, p. 5);

865 (4) her position on the treatment of Verizon's merger-related savings
866 (Marshall Rebuttal, p. 6);

867 (5) her claim that Verizon's modeling of shared costs creates the
868 opportunity for double-counting (Marshall Rebuttal, p. 7);

869 (6) her criticism of the calibration adjustment discussed in my rebuttal
870 testimony (Marshall Rebuttal, pp. 7-8); and,

871 (7) her position on Verizon's use of the C. A. Turner indices (Marshall
872 Rebuttal, pp. 8-9).

873

874 **Q. HAS MS. MARSHALL OFFERED ANY NEW EVIDENCE CONCERNING**

**HER CLAIM THAT ICM DOES NOT COMPLY WITH THE COMMISSION'S ADMINISTRATIVE RULES?**

A. No. She merely points out that the ARMIS data used as a starting point for ICM's expense inputs do not reflect any productivity gains that have occurred since 1999, and takes exception to Verizon's use of the C. A. Turner indices to calculate the reproduction cost of Verizon's general support assets. In stating that the ARMIS data do not reflect any productivity gains since 1999, Ms. Marshall has overlooked the fact that ICM's adjustment for merger savings assumes that all of the merger savings were realized at the close of the merger transaction, even though the order approving the merger acknowledged that the savings would not be fully realized until three years later. Also, Ms. Marshall has failed to note that the ARMIS data do not reflect any inflation in expenses that has occurred since 1999. As I noted at the beginning of my surrebuttal testimony, Verizon agrees with an adjustment to reflect productivity gains provided a corresponding adjustment for inflation is also made.

I discuss Ms. Marshall's and Staff's position on the C. A. Turner indices elsewhere in my surrebuttal testimony. However, her claim that the carrying costs of the general support assets exceeds the actual carrying costs needs to be examined in light of her definition of the "actual carrying costs" of these assets. The response to Verizon data request VZ-STAFF 4.11 indicates that Ms. Marshall believes that the actual carrying costs should be based on the 13-month average book costs. Using the embedded book amounts as the basis for the forward-looking carrying costs is certainly contrary to the Commission's administrative rules. For example, Part

791.20(c) states that "Forward-looking costs ignore embedded or historical costs" – in her initial criticisms of ICM, Ms. Marshall cited this very portion of the administrative rules. (Marshall Direct, p. 3). Given the choice between the embedded cost of these assets and their reproduction cost, the Commission should choose the reproduction cost if it desires to be consistent with its own rules.

**Q. IS YOUR REBUTTAL TESTIMONY INCONSISTENT AS MS. MARSHALL CLAIMS?**

A. No. She argues that it is inconsistent for me to make forward-looking adjustments to the 1999 ARMIS expense data while claiming at the same time it would be incorrect to use demand data, forecasted or otherwise, that did not match the 1999 ARMIS data to calculate ICM's per unit costs. In making this argument, Ms. Marshall has failed to recognize that none of the forward-looking adjustments made to the 1999 ARMIS data related to the scale of the operations that generated them. Clearly, it would be incorrect to base operating expenses on a network of 971 thousand access lines and to then calculate per-unit costs on a much larger or smaller network. Contrary to Ms. Marshall's assertion, there is a matching issue to be considered.

**Q. IS MS. MARSHALL CORRECT WHEN SHE SAYS VERIZON USED A 10-YEAR DEMAND FORECAST IN ITS NEW YORK UNE CASE?**

A. Yes. However, Verizon used the forecast only to determine the sizing for distribution and feeder cable – the filed per-unit costs were not based on the 10-year forecast. Consequently, Verizon New York's use of the 10-year forecast to

921 determine cable sizing (and not per-unit costs) does not support Ms. Marshall's
922 recommendation that forecasted demand data be used as a divisor to determine per-
923 unit costs in Illinois.
924
925 **Q. IS MS. MARSHALL CORRECT THAT THE REQUIREMENT THAT THE**
926 **MERGER SAVINGS BE EQUALLY SHARED WITH THE COMPANY AND**
927 **ITS CUSTOMERS IS NOT A COST STUDY ISSUE?**
928 A. Since the sharing of the merger savings will ultimately be reflected in approved rates,
929 she is correct in a narrow sense. However, as I noted at the beginning of my
930 surrebuttal testimony, there are two ways in which this sharing can be achieved.
931 Either costs can be reduced downward by one-half of the estimated savings, or the
932 common cost allocator can be adjusted to include one-half of the merger savings in
933 rates, with all of the merger savings reflected in costs. Even though Verizon believes
934 that the former method is superior, since the merger savings will follow the accounts
935 with which they are associated, this is ultimately a decision only the Commission can
936 make.
937
938 **Q. IS MS. MARSHALL CORRECT THAT ICM'S MODELING OF SHARED**
939 **COSTS CREATES AN OPPORTUNITY FOR DOUBLE RECOVERY?**
940 A. No. The shared costs modeled by ICM are assigned to the basic components that
941 make up the network -- the poles, the cables, etc. These in turn are combined to
942 create Verizon's forward-looking per-unit TELRICs and LRSICs. Unless, for
943 example, Verizon could manage to sell a loop to one of its end users and at the same

time unbundle the same loop for use by a CLEC, no double recovery is possible.

**Q. PLEASE COMMENT ON MS. MARSHALL'S POSITION ON THE CALIBRATION ADJUSTMENT DISCUSSED IN YOUR REBUTTAL TESTIMONY.**

A. Ms. Marshall recommends that the Commission disallow the calibration adjustment described in my rebuttal testimony. The basis of her recommendation is that introduction of the adjustment is not timely and constitutes improper rebuttal. Her claim is incorrect because my rebuttal testimony on this issue (Tucek Rebuttal, pp. 47-48) responds to her direct testimony concerning "the importance of reflecting any change in the amount of directly assigned costs, including shared costs, in the calculation" of the fixed allocator. (Marshall Direct, p. 9). If the adjustment is not made, then in total the amount of direct and shared costs reflected in the LRSICs and TELRICs will have changed from the $86.7 million dollars identified in the numerators of ICM's expense-to-investment ratios to only $81.9 million. The $6.8 million shortfall is clearly a change in the amount identified as ICM's forward-looking costs, and adjusting the fixed-allocator to reflect this change is entirely consistent with the position Ms. Marshall took in her direct testimony.[12] Additionally, the recommendation is certainly timely, since no final determination on the Company's cost study has been made by the Commission.

[12] Just to be clear, it is not my position that the shortfall be fixed at $6.8 million. The exact amount will be affected by any decreases or increases to Verizon's forward-looking costs that may be ordered.

**Q. PLEASE COMMENT ON MS. MARSHALL'S TESTIMONY CONCERNING THE USE OF THE C. A. TURNER INDICES.**

A. In addition to the same FCC order cited by Mr. Koch, Ms. Marshall's opposition to the C. A. Turner indices relies on her inability to verify how the index is constructed, and on the lack of a witness to answer detailed questions concerning the methodology used to develop the index. This is a more stringent standard than Staff has applied to itself. For example, even though Mr. Koch offered the opinion that the SLC-96 is a forward-looking DLC, he disavows the knowledge and expertise to make specific network design recommendations. (Koch Rebuttal, pp. 14-15). Clearly, Staff does not have a witness capable of supporting this recommendation. Likewise, in his direct testimony, Mr. Zolnierek proposed use of the GDP deflator and a productivity offset taken from an FCC proceeding without explaining how the deflator or the offset were developed, or why they were appropriate for use in Illinois. Moreover, while it is true that Verizon relied on the publicly available C. A. Turner indices without presenting each and every detail of their development, the cost study filing does contain a description of the indices that explains their development and how they are to be used. Finally, the development of the composite C. A. Turner indices for each account that ICM uses as its inputs is shown in the schedule labeled as Attachment J.1 in the file "Section 7.pdf" in the cost study filing. Ms. Marshall's opposition to the use of the C. A. Turner indices is unfounded and should be ignored by the Commission.

**D. Ms. Buckley's Testimony**

**Q. PLEASE COMMENT ON MS. BUCKLEY'S REBUTTAL TESTIMONY.**

A. Ms. Buckley has repeated her assertion that modifying inputs in ICM is difficult, even though input changes in ICM are, in fact, easily accomplished. (Buckley Rebuttal, p. 4; Tucek Rebuttal, pp. 53-56). At the same time, she criticizes ICM for being susceptible to misuse because it is possible to modify inputs, for example, to reflect the impact of using a 2-pair drop. (Buckley Rebuttal, p. 6). This criticism contradicts Ms. Buckley's desire for easily-modified inputs, since it is the ease with which ICM's inputs can be modified that creates her perceived problem. In any event, this is really not a problem at all. As in all cost study proceedings, Verizon will undoubtedly make a compliance filing of its cost study to reflect the changes ordered to ICM's inputs, and will demonstrate that the changes have indeed been made.

While I take issue with many of the assessments of ICM that Ms. Buckley made in her review of ICM, in the end we seem to have arrived at the same place. For example, Ms. Buckley agrees that ICM is very flexible and that nearly all of the assumptions that drive decision rules within the model are user changeable. In particular, I agree with her conclusion that "users can make changes without difficulty." (Buckley Rebuttal, p. 8).

## V. IRCA'S AND AT&T'S CRITICISMS ARE UNFOUNDED

**A. Mr. Hendricks' Testimony**

**Q. WHAT PORTIONS OF MR. HENDRICKS' REBUTTAL TESTIMONY DOES THIS SECTION OF YOUR SURREBUTTAL ADDRESS?**

A. This section of my surrebuttal testimony discusses the following portions of Mr. Hendricks' rebuttal testimony:

(1) his comparison of ICM's forward-looking costs with those produced in ICC Docket No. 97-0515 (Hendricks Rebuttal, pp. 3-4);

(2) his claims regarding the reproduction cost of Verizon's existing network (Hendricks Rebuttal, pp. 6-8);

(3) his misunderstanding and mischaracterization of my rebuttal testimony concerning his comparison of ICM's loop costs with existing rates (Hendricks Rebuttal, pp. 9-10); and,

(4) his unsupported claim that ICM relies on inaccurate customer location information (Hendricks Rebuttal, pp. 13-17).

**Q. SHOULD THE COMMISSION RELY ON MR. HENDRICKS' COMPARISON OF ICM'S COSTS WITH THOSE FROM ICC DOCKET NUMBER 97-0515?**

A. No. In computing the loop cost based on the study filed in Docket No. 97-0515, Mr. Hendricks has ignored the fact that in that study, the minimum and maximum average drop lengths equaled 100 and 250 feet, respectively. The comparable inputs in ICM are set to 52 and 465 feet. He also excluded billing and collection costs from

his calculated estimates, even though ICM includes billing and collection in its 2-wire loop TELRIC. Finally, Mr. Hendricks overlooked the fact that the costs reported in Docket No. 97-0515 excluded the costs ICM identifies as shared. As presented in his rebuttal testimony, Mr. Hendricks' cost comparison is meaningless, and should be ignored by the Commission.

**Q. IS IT POSSIBLE TO MODIFY ICM TO MAKE THE COMPARISON MORE VALID?**

A. Yes. I have made the comparison more valid by adding the $0.93 per line billing and collection costs estimated in Docket No. 97-0515 to Mr. Hendricks' estimate of loop costs – this increases his estimate to $22.08 per line. (If Mr. Hendricks would have included billing and collection in his calculated loop costs his $5.81 difference would have been only $4.88 per loop.) I also made the following changes to ICM's inputs:

(1) increased the minimum average drop length to 100 feet;

(2) decreased the maximum average drop length to 250 feet;

(3) excluded shared costs.

Finally, Mr. Hendricks is correct that the loop costs from Docket No. 97-0515 reflect assignment of 100 percent of the main distribution frame (MDF) and that ICM reflects only 50 percent. Consequently, I changed ICM's mapping code to include 100 percent of the MDF investment as well.

**Q. WHAT WERE THE RESULTS OF THE ABOVE MODIFICATIONS TO ICM?**

A. The resulting 2-wire loop TELRIC is $24.66 – this is an increase of $2.58 over the loop cost presented by Mr. Hendricks, adjusted to include billing and collection. More than half of Mr. Hendricks' $5.81 is seen to disappear once the two models are put on a more equal footing.

**Q. DOES THE FACT THAT ICM PRODUCES HIGHER COSTS EVEN AFTER THESE MODIFICATIONS MEAN THAT ICM IS FLAWED?**

A. No. As I explain below, dispersion among customers is an important determinant of loop costs. Cost studies that rely only on average loop length or the distribution of loop lengths, like the cost study filed in ICC Docket No. 97-0515, do not adequately account for dispersion among end-user customers. Also, the cost study in ICC Docket No. 97-0515 did not recognize the fact that copper cable comes in discrete sizes. Instead, it interpolated cable costs based on an assumed curve. By comparison, ICM models the dispersion between customer locations and recognizes the impact of discrete cable sizes. Additionally, the conduit systems and manholes modeled by the earlier study were not determined by the size or number of cables they needed to accommodate. Instead, the study used a single 4-inch PVC pipe for all conduit systems and a 4'x4'x4' pull box for all manholes. ICM models both manholes and pull boxes, and sizes conduit systems based on the required number of ducts.

**Q. ARE MR. HENDRICKS' COMMENTS WITH RESPECT TO THE REPRODUCTION COSTS OF VERIZON'S EXISTING NETWORK WARRANTED?**

A. No. Mr. Hendricks has characterized my comparison of ICM's modeled investment with the reproduction cost as an "embedded-plus" methodology. His argument rests on the unsupported assertion that the reproduction cost of the network is "inflated" and that I am proposing that the costs underlying the UNE rates be based on the reproduction costs of the existing network. This is simply not true.

In my rebuttal testimony, I did not propose that the reproduction cost of the network be used as the basis for determining Verizon's forward-looking TELRICs and LRSICs. Rather, in response to the charges that ICM produced costs that were too high and were based on an "overbuilt network", I only offered a comparison of ICM's modeled investment with the reproduction cost of the existing network. The reasoning behind using the reproduction cost is straightforward and simple: if the investment associated with the forward-looking modeled network exceeds the reproduction cost of the existing network by a substantial margin, then the assumptions and inputs underlying ICM might be suspect. Conversely, if the charge that ICM models an overbuilt network were true, then one would expect the modeled investment to substantially exceed the existing network's reproduction cost. As my rebuttal testimony showed, the evidence does not support the charge levied against ICM. ICM's modeled investment, both overall and for the network plant accounts as a group, is very close to the existing network's reproduction cost. This evidence

contradicts the charges that ICM models an overbuilt network and produces costs that are too high. Further, Mr. Hendricks' charge that ICM produces inflated costs is really nothing more than a complaint that the modeled investment exceeds the book investment. If this were a legitimate concern, then the Commission's Administrative Rules would not provide for developing costs on a forward-looking basis – they would simply specify the assignment of book costs among services.

**Q. DOES MR. HENDRICKS UNDERSTAND YOUR REBUTTAL TESTIMONY CONCERNING THE COSTS PRODUCED BY ICM AND THE COSTS UNDERLYING VERIZON'S EXISTING LOCAL RATES?**

A. No. Mr. Hendricks wrongly concludes that my rebuttal testimony supports his claim that CLECs would be precluded from using UNE loops to compete with Verizon. Whether or not his claim is warranted depends on a number of issues, such as the overall CLEC cost structure and the other services that they might offer in addition to local exchange service, that Mr. Hendricks has not addressed anywhere in any of his testimony. My rebuttal testimony only addressed the charge that ICM models an overbuilt network based on Mr. Hendricks' comparison of ICM with existing retail rates. My rebuttal testimony demonstrated that the differences between ICM's costs and the costs underlying the current retail rates were not due to the network modeled by ICM. Instead, they were shown to result from the improved assignment of operating expenses among the various network elements, from the differences in the composition of wire centers, and from the sampling methodology underlying the earlier set of costs.

**Q. HAS MR. HENDRICKS DEMONSTRATED THAT ICM'S MODELING OF CUSTOMER LOCATIONS IS INACCURATE?**

A. No. Mr. Hendricks originally made this charge in his direct testimony. His argument then, and now, is that ICM must be based on inaccurate customer locations because they are not geocoded and because ICM's costs are "too high" relative to existing retail rates or some other benchmark. I demonstrated in my rebuttal testimony that the differences between ICM's costs and the existing retail rates result from factors unrelated to ICM's modeled network. Consequently, one cannot draw any inferences about the adequacy of ICM's customer location inputs based on a comparison of ICM's costs with existing rates. Moreover, geocoding is not the panacea that Mr. Hendricks made it out to be in his direct testimony. Besides being a costly and time-consuming endeavor, geocoding is never anywhere near 100 percent successful.[13] Consequently, models that rely on geocoded customer locations must employ some sort of surrogate method to develop "geocoded" locations for customers that could not be located.

**Q. IS MR. HENDRICKS' RECOMMENDATION TO USE A SAMPLE OF AVERAGE LOOP LENGTHS VIABLE?**

A. No. In response to Verizon data requests VZ-IRCA 2.01 and VZ-IRCA 2.02, Mr. Hendricks indicated that loops would need to be sampled from only a subset of wire

[13] Indeed, the industry's biggest proponent of geocoding, AT&T, reports a success rate of only 73 percent for Illinois overall, and 56 percent for Verizon's Illinois network. Additionally, the geocoded data underlying AT&T's HAI model is based on a 1997 Metromail address list, and has never been updated.

centers and that the number of records in ICM's demand table would consequently be reduced. This response indicates that Mr. Hendricks has not reviewed ICM to the extent necessary to achieve even a basic understanding of the model's methodology. ICM does not base its cost calculations on the average loop length for a wire center. ICM uses the customer location inputs at the grid level in the demand table and the wire center locations and boundaries to reconstruct the local exchange network based on discrete sizes of network components and Verizon's engineering guidelines. It is not possible to model the network with fewer records in the demand table because the table would then represent a much smaller network. In any event, Mr. Hendricks' recommendation calls only for the calculation of the average loop length within a wire center – this information is insufficient to populate even one record in the demand table.

Moreover, even if Verizon knew the exact distribution of loop lengths for every wire center, this would not mean that ICM's demand table could be populated or that forward-looking costs would be modeled more accurately. While Mr. Hendricks is correct that loop length is an important driver of loop costs, it is not the only driver. Equally important is the dispersion of customers within a wire center. Consider, for example a wire center which served only four customers, each with a loop length of 5,000 feet. The cost of serving these customers depends on how dispersed they are from each other. Clearly, the costs will be much less if they are all located at one spot than if they were located at the four points of the compass. Likewise, knowledge of the distribution of loop lengths within a wire center does not provide

enough information about the dispersion among customers. Consider two wire centers that have the exact same distribution of loop lengths and the same number of customers and access lines. If the customers in the first wire center are distributed largely along a main north/south road, while the customers in the second are more or less evenly dispersed throughout the wire center, then the average cost of a 2-wire loop in each wire center will differ. This will be true even though the total number of lines served and the loop length distributions are identical. Hence, the average loop length, or even the distribution of loop lengths within a wire center, is insufficient to model the impact of customer dispersion on the cost of a loop. The best way to accomplish this is with the level of detail contained in ICM's demand table.

**Q. IS ICM'S MODELING OF CUSTOMER LOCATION SUPERIOR TO ONE THAT RELIES ONLY ON THE DISTRIBUTION OF LOOP LENGTHS?**

A. Yes. As I explained in my direct testimony, ICM customer locations are based on estimates of access line counts at the census block level. The census block totals are assigned to each demand point (a $1/200^{th}$ by $1/200^{th}$ degree grid) on the basis of the amount of road feet in each demand point. The road feet measure corresponds to the types of roads along which residential or business development would normally occur, and from which customers would have access to their premises. The measure excludes interstate highways, limited access roads, bridges, tunnels, access ramps, and motorcycle trails because these are not roads along which customers typically are located. Alleys and driveways are also excluded because including them would

overstate the amount of road feet along which telephone plant is placed. Each grid is mapped to Verizon's wire center based on the exchange boundary. Because the resulting totals for business and residence access lines do not sum to the ARMIS totals for the wire center, the demand assigned to each grid is scaled up or down so that the sum of the adjusted demand ties to ARMIS for each wire center.

This approach is superior to one that relies on average loop length, or even the distribution of loop lengths, because it accounts for the dispersion among customer locations within a wire center. It is a reasonable approach because it relies on road feet to develop the dispersion among customers and because roads are generally constructed to get somewhere, be it a residence or business location. Moreover, as I pointed out in my rebuttal testimony at page 37, the total amount of sheath feet modeled by ICM is *1.2 percent less* than the actual amount in the network. Clearly, ICM's customer location inputs have not resulted in too much local loop plant being built in the modeled network.

## B. Mr. Boyles' Testimony

**Q. WHAT PORTIONS OF MR. BOYLES' REBUTTAL TESTIMONY DOES THIS SECTION OF YOUR SURREBUTTAL ADDRESS?**

A. This section of my surrebuttal testimony addresses Mr. Boyles' comments on the following topics:

(1) his claim that Verizon's engineering practices and network

characteristics are inefficient (Boyles Rebuttal, p. 3 and p. 5);

(2) his continued allegation that ICM is not flexible (Boyles Rebuttal, p. 4);

(3) his claim that Verizon could have saved additional work by not creating PDF files (Boyles Rebuttal, pp. 4-5);

(4) his comments on the switch prices and switch discounts used to develop ICM's switching costs (Boyles Rebuttal, pp. 7-8);

(5) his claims concerning the proper modeling of RTU fees (Boyles Rebuttal, pp. 9-10);

(6) his comments concerning the impact of the SCIS input for call completion ratios (Boyles Rebuttal, p. 12);

(7) his claim that he has used the best alternative evidence he could find to support his EF&I recommendation (Boyles Rebuttal, p. 13);

(8) his attempt to rehabilitate his adjustment to call setup investment to reflect getting started costs (Boyles Rebuttal, p. 15);

(9) his justification of his proposed elimination of all sales, marketing and advertising expenses from switched access costs (Boyles Rebuttal, p. 16); and,

(10) his defense of his adjustments to ICM's switch costs and IAF inputs (Boyles Rebuttal, pp. 17-19).

**Q. PLEASE COMMENT ON MR. BOYLES' CLAIM THAT VERIZON'S ENGINEERING PRACTICES AND NETWORK CHARACTERISTICS ARE INEFFICIENT.**

A. In his rebuttal testimony, Mr. Boyles has narrowed the scope of this claim to include only his allegation that Verizon has modeled switches that are too large compared to their capacity. In repeating this allegation, Mr. Boyles again ignores the fact that digital switches are scaleable. In other words, the capacities he quotes at page 10 of his direct testimony are only the upper limits on the number of lines each switch type can serve – they are not the capacity of every such switch installed in Verizon's network or modeled by ICM. In particular, his analogy involving a nine-passenger van is incorrect: in both the real and modeled network, the choice is not between a large switch (the van) and a small switch (a two-seater). Instead, the switch is sized on the basis of the number of lines and trunks to be served, and on the expected offered load for the switch.

**Q. WILL AN EFFICIENT TELECOMMUNICATIONS PROVIDER CHANGE THE TECHNOLOGY EMPLOYED IN A GIVEN WIRE CENTER JUST BECAUSE SOME OTHER SWITCH VENDOR MIGHT OFFER LOWER PRICES?**

A. No. An efficient carrier will not replace existing switches with another vendor just because the relative prices among vendors have changed. If this were indeed an efficient practice, we would see firms in other industries engaging in similar behavior. For example, we would see airlines switching their entire fleet back and forth between Boeing and Airbus, depending on which manufacturer offered the lowest price for a single plane. As I stated in my rebuttal testimony, Mr. Boyles' proposal to model costs on the basis of the minimum so-called target cost per line is

flawed simply because Verizon is not going to replace the switches in its wire centers. As the Florida Commission found, "there needs to be a basis in reality if the costs developed for the network are to have any relevance to the cost of basic local telephone service." (Order, Docket No. 98-0696TP; p. 129; January 7, 1999). Mr. Boyles' proposal for switching costs is demonstrably wrong because it has no basis in reality.[14]

**Q. PLEASE COMMENT ON MR. BOYLES' CLAIM THAT ICM IS NOT FLEXIBLE.**

A. In his rebuttal testimony, Mr. Boyles has narrowed the scope of this claim to the single issue of updating ICM's switching inputs to reflect changes in the output from SCIS-MO. His only point is that the number of records involved (1,397) is greater than the 510 values needed to affect an across-the-board change to ICM's material inputs table. What he has ignored, however, is that SCIS-MO will write its output to a text file that can then be read into ICM. Tellingly, he has not commented on whether or not he has the ability to extract information from such a file, even though his proposed adjustment to getting started costs reveals that he is. (Tucek Rebuttal, p. 66, footnote 11).

**Q. IS IT TRUE THAT VERIZON COULD HAVE AVOIDED THE ADDITIONAL STEP OF CREATING PDF FILES BY FILING THE**

[14] Similarly, Mr. Boyles' suggestion that Verizon is moving away from the GTD-5 has no basis in reality. (Boyles Rebuttal, p. 6). Verizon continues to purchase GTD-5 remotes in other states, and will purchase them in Illinois if circumstances require it. The fact that Verizon no longer purchases GTD-5 host switches merely reflects the fact that Verizon's network is 100 percent digital in those states where the GTD-5 is

**UNDERLYING EXCEL SPREADSHEETS INSTEAD?**

A. No. Mr. Boyles is correct when he agrees that PDF files are an efficient substitute for hardcopy documentation. However, he has overlooked the other benefit that comes from using PDF files – as I noted in my rebuttal testimony, PDF files insure that all parties are viewing the same information in terms of content and location. Even if Verizon had included the underlying Excel spreadsheets in its filing, Verizon would still have filed the PDF versions in order that no confusion is caused by inadvertent changes to the spreadsheets, or by differences among printers. Additionally, even though Mr. Boyles makes the general claim that parties are burdened by reliance on the PDF files, he has not claimed that his analysis of ICM was hindered, nor does the scope of his testimony suggest that it was.

**Q. IS MR. BOYLES CORRECT WHEN HE SAYS THE COMPOSITE C. A. TURNER INDEX FOR ACCOUNT 2212 SHOWS THAT DIGITAL SWITCHNG COSTS ARE DROPPING?**

A. No. The fact that the composite number, which is calculated across all vintage years, is less than one shows only that digital switch prices have fallen since the introduction of this technology. This is hardly surprising, since as the market for a new technology develops, volumes increase and manufacturers can take advantage of increasing economies of scale.[15] Even if Mr. Boyles could make a case that switch prices will continue falling, and even if he could quantify that decline, it would be

deployed.

[15] Indeed, the nearly complete replacement of analog switches with digital switches suggests that some of these scale economies will no longer be realized.

incorrect to incorporate that information into Verizon's cost estimates without also updating the prices of all of the other resources used to operate the network. To select only one item, or just a few items, simply because Mr. Boyles imagines that the prices are dropping would bias the cost estimation process in favor of AT&T and the other CLECS. Finally, as I explained above, Verizon's use of a mix of the pricing for additions and initial switch placements understates the current cost of switching resources.

**Q. IS MR. BOYLES CORRECT WHEN HE SAYS THAT YOU ERRED IN ESTIMATING THE IMPACT OF BASING SWITCH COSTS ON DISCOUNTS SPECIFIC TO THE LINE SIZE OF THE SWITCH?**

A. Yes. In making my original adjustment, I inadvertently divided ICM's switch inputs by the average discount factor and multiplied by the line-size-specific discount. Because the resulting investment is calculated by multiplying the SCIS and CostMod list prices by one minus the discount factor, the correct adjustment should have multiplied and divided by one minus the respective discount factors. As I stated in my discussion of Issue (6) in Surrebuttal Attachment DGT-1, Verizon is willing to make this modification to its cost study.

**Q. DID VERIZON ERR IN ITS MODELING OF RTU FEES AS MR. BOYLES CONTENDS?**

A. No. The note from the SCIS input screen quoted by Mr. Boyles does not reflect the current industry accounting practice of capitalizing both operating system and

application software fees. Verizon did not err by including the RTU fees for end-user features in the SCIS-MO inputs.

**Q. IS IT TRUE THAT SETTING THE CALL COMPLETION RATIO TO 65 PERCENT IN SCIS WILL DECREASE THE UNIT INVESTMENTS USED AS INPUTS TO ICM?**

A. Yes. The statement in my rebuttal testimony resulted from an incorrect interpretation of the sign on the difference between the filed and modified investments. Nevertheless, the approach followed by Verizon in its cost study filing is correct since it allows the call completion ratio to be varied by the user without having to rerun SCIS-IN. Moreover, the impact on the estimated costs is not material since only three inputs to ICM are affected, and since the decrease in the unit investments is less than five hundredths of one percent in each instance.

**Q. HAS MR. BOYLES RELIED ON THE BEST AVAILABLE EVIDENCE TO SUPPORT HIS RECOMMENDED CHANGE TO ICM'S EF&I FACTOR?**

A. No. In his direct testimony, Mr. Boyles relied only on an ALJ's recommended decision in a UNE docket involving Verizon New York. Since the time of that recommended decision, and prior to the filing of Mr. Boyles' rebuttal testimony, the New York PSC has issued a final order in that case. The order effectively reversed the ALJ's recommendation for a 30 percent EF&I factor, and ordered the input be reduced from 43.5 percent to 40 percent. (Order, New York Public Service Commission Case 98-C-1357; January 23, 2002; p. 33). This is a decrease of only

3.5 percentage points. Even if Mr. Boyles were to revise his recommendation to reflect an across-the-board EF&I input of 40 percent, his recommended decrease would be 11.8 percentage points. This is still many times greater than the change ordered by the New York commission.[16] Further, in his rebuttal testimony, Mr. Boyles wrongly claims that ICM's EF&I factors are based on historical costs. This is simply not true – the factors are based on current labor costs and on the same forward-looking switch investments used to develop ICM's switch discount and IAF inputs. Mr. Boyles is also wrong when he claims that he acknowledges the linkage between EF&I costs and switch investment. The recommended decision that Mr. Boyles relied on specifically provided for an upward adjustment in the proposed EF&I input to reflect the ALJ's proposed downward adjustment in Verizon New York's switching costs. Mr. Boyles proposed no such upward adjustment for the EF&I input even though he proposed a decrease in Verizon's Illinois switching costs. Mr. Boyles cannot credibly claim he has relied on the best available support for his EF&I recommendation when he ignores the ALJ's own recommendation on this topic, let alone the final order in the New York case.

**Q. SHOULD THE COMMISSION ADOPT AN ACROSS-THE-BOARD EF&I INPUT FOR ICM BASED ON THE ORDER IN THE NEW YORK UNE CASE?**

[16] In my rebuttal testimony at lines 1856 and 1866, I misused the term "basis points". Since 100 basis points equals 1 percentage point, my reference to a "135 basis point decrease" should have been a "13.5 percentage point decrease". Similarly, my reference to a "decrease of 218 basis points" should have been a "decrease of 21.8 percentage points". The statement that Mr. Boyles' proposed decrease was 1.6 times greater is still valid.

A. No. Mr. Boyles would have this Commission believe that the EF&I input recommended by the New York ALJ reflects Verizon's Illinois costs. (Boyles Rebuttal, p. 13). Presumably, this argument extends to the ordered input of 40 percent. But the 40 percent does not even reflect Verizon's New York costs – their costs produce an input of 43.5 percent. More to the point, there is no reason to believe that the EF&I inputs between the two states should be the same. Verizon's Illinois input is based on the labor and switching costs that it actually experiences. Additionally, the input varies by switch size and technology. By comparison, the New York input is a composite across several former Bell Atlantic states and is applied to all switch sizes. Even if these states had comparable labor costs, they have a different mix of switch sizes and types. Mr. Boyles' assertion that the New York input represents "Verizon's costs and therefore should be comparable" is completely unsupported and is nothing more than an attempt to decrease the cost estimates produced by ICM.

**Q. DOES MR. BOYLES' REBUTTAL TESTIMONY SUPPORT HIS ADJUSTMENT TO ICM'S CALL SETUP INVESTMENTS?**

A. No. He merely asserts all of the getting started costs should be assigned to the port, without considering what switching resources these costs represent. As I explained above in my discussion of Surrebuttal Attachment DGT-2, it is possible to partition the switch into those components that are engineered on lines and those components that are engineered on usage. Only the investment associated with line terminations

are properly assigned to the port. That is what CostMod does with respect to the GTD-5 and that is what I did for the Lucent and Nortel switches with the call setup adjustment I described in my rebuttal testimony. The effect of the adjustment is small because none is needed for the GTD-5 switches and the portion of SCIS's "getting started" costs associated with line terminations, and hence the port, is also small.

**Q. PLEASE COMMENT ON THE PORTION OF MR. BOYLES' REBUTTAL TESTIMONY DEALING WITH SALES, MARKETING AND ADVERTISING (S/M/A) EXPENSES.**

A. Mr. Boyles has not repeated his assertion that all of the S/M/A expenses be removed from switched access costs. Nor has he acknowledged that these costs cover legitimate activities that one does not normally think of when considering "marketing" costs. Nevertheless, Mr. Boyles seems to acknowledge that some provision for S/M/A expenses is appropriate. (Boyles Rebuttal, p. 61). In the absence of a specific alternative recommendation on his part, I can only conclude that he considers the amount modeled by ICM to be appropriate. Also, since he disavows that his main objective is to reduce the costs produced by ICM and claims that his main objective is to correct errors in ICM's inputs, I can only conclude that he agrees that ICM's S/M/A inputs be adjusted to correct the built-in shortfall that I describe at pages 79-80 of my rebuttal testimony.

**Q. DOES MR. BOYLES' REBUTTAL TESTIMONY SUPPORT HIS**

**ADJUSTMENTS TO ICM'S SWITCH INVESTMENTS AND IAF INPUT?**

A. No. He only repeats information that is already known, namely, that line size is just one determinant of switch costs. Additionally, he argues that because Verizon developed the switch discount inputs to scale the SCIS and CostMod "list prices" to levels comparable to those Verizon pays vendors for initial switch purchases, he is justified in adjusting the resulting modeled investments from SCIS and CostMod to the calculated per-line costs that the discounts are based upon. This argument ignores what he concedes to be true – that line size is not the only determinant of switch costs. In forcing the modeled investments to agree with the per-line costs of the model office clusters, Mr. Boyles is in effect asserting that line size is all that matters. This is contrary to his own testimony and ignores the wire center specific differences in costs that CostMod and SCIS model.

**Q. SHOULD THE COMMISSION BE CONCERNED THAT THE MODEL CLUSTERS UPON WHICH THE SWITCH DISCOUNTS ARE BASED DIFFER FROM THE STAND-ALONE AND HOST/REMOTE SWITCHES IN ILLINOIS?**

A. No. In waving this red flag, Mr. Boyles would have the Commission ignore the fact that ICM is a model and, like any model, it is a simplification of reality. It simply is not realistic to expect that Verizon could ask its vendors for current pricing on each switch in Illinois and obtain meaningful results. There is no alternative to the approach that Verizon has taken with ICM: obtain pricing for a set of model office clusters and use this pricing to develop the SCIS and CostMod discount inputs. In

any event, I note that if Mr. Boyles really believed that this approach "undermined the foundation of Verizon's entire switch input development," he would not recommend that the ICM's investment inputs be adjusted to hit the per line switch costs of the model office clusters.

**Q. IS MR. BOYLES CORRECT WHEN HE SAYS HE DID NOT HAVE THE INFORMATION NEEDED TO CALCULATE THE PER-LINE INVESTMENT FOR INDIVIDUAL BASE UNITS AND REMOTES IN ICM'S MODEL OFFICE CLUSTERS?**

A. No. This information is in the file that Mr. Boyles took his information from. For example, the cost used for a 2,600 line DMS-100 remote is found in cell G622 of the tab labeled "D100PRIWKSHT" in the file "IL Discount 1020.xls".

**Q. DOES MR. BOYLES' CLAIM THAT HE DOES NOT EXPECT VERIZON TO REPLACE THE GTD-5 SWITCHES IN THE REAL WORLD, EVEN THOUGH HE MAINTAINS THAT COSTS BE DEVELOPED UNDER THIS ASSUMPTION, MAKE SENSE?**

A. It certainly does not make sense to me. He says that his adjustments are intended to make ICM's switching costs forward-looking and efficient, and apparently concludes that the question of whether the modeled switch prices for the substitute switches could actually be obtained is not relevant. I could not disagree more. As I explained above, no efficient carrier would ever replace all of its switches at once simply because of changes in relative prices among vendors, nor would they price switching

services under such an assumption. If anything, an efficient carrier would base switching rates on the costs of additions to its existing network, except in those circumstances where concrete plans existed to replace a specific switch.

## VI. SUMMARY

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH THE TWO MAIN CRITICISMS OF ICM.**

A. The two main criticisms levied against ICM are unsupported and without merit. Specifically:

(1) as shown in Surrebuttal Attachment DGT-1, ICM possesses sufficient flexibility to be modified in response to the major criticisms of Staff and the other parties;

(2) contrary to the testimony of Mr. Zolnierek and Mr. Boyles, switching costs are usage-sensitive.

With respect to item (1), I note that Verizon does not agree with all of the modifications to ICM shown in Surrebuttal Attachment DGT-1, and that any modifications that increase or decrease direct costs will require adjustments to Verizon's fixed allocator for common costs. With respect to item (2), it is clear that switches are not just line-constrained and that switching costs are not incurred only on a per-line basis. Additionally, Mr. Zolnierek's recommendation to abandon SCIS and CostMod should be ignored, because it is based on his incorrect assertion that

switching costs are incurred on a per-line basis, and because it ignores the findings of other state commission and the fact that switches are engineered based on the offered load.

**Q. PLEASE SUMMARIZE THE COMMON FLAW SHARED BY THE ARGUMENTS THAT ICM'S COSTS ARE TOO HIGH.**

A. Many of the parties have argued that ICM produces estimated costs that are too high. Not only are the individual criticisms underlying these claims deficient in their own right, they also suffer from a common flaw: they all ignore a substantial amount of evidence that ICM produces cost estimates that are below the forward-looking costs of provisioning unbundled network elements and switched access out of Verizon's Illinois network. Because ICM models the network as if it were built all at once, it assumes economies of scale that do not exist in the real world. As a consequence, the cost estimates produced by ICM are a lower bound on Verizon's forward-looking costs of provisioning telecommunications services in Illinois. Second, the assumptions underlying ICM do not reflect the costs of transitioning the existing network to the network required in a UNE environment. Finally, the switching costs assumed by ICM are understated because they are based on 365 equivalent business days per year, and because they are heavily weighted towards initial switch discounts that likely will not be realized going forward. With respect to this latter issue in particular, Verizon's national network, and the networks of BellSouth, Qwest and SBC are more than 96 percent digital on a combined basis. Consequently, the pricing for switch additions is more representative of the revenue streams that switch

vendors require to sustain themselves, or the product line, as a going concern. To the extent that one of the Commission's objectives is to establish rates that signal the incremental costs of the underlying resources, the pricing for switch additions is clearly more appropriate than the initial switch pricing assumed by ICM.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MR. KOCH'S OTHER CRITICISMS OF ICM.**

A. Mr. Koch's opposition to Verizon's use of the C.A. Turner index is based solely on his reliance on an FCC order and should be ignored by the Commission. The reasoning underlying the FCC order is flawed, since it is based on a preference for a broadly-based index, and since no broadly-based index exists that adequately captures the relative price changes in telephone plant. To the contrary, a narrowly-focused set of indices is what is required to estimate the reproduction cost of Verizon's existing network. While the users of the C. A. Turner indices are necessarily limited to firms in the telecommunications industry, in Florida AT&T's witness has testified that the indices are commonly used in the industry. Moreover, the indices are publicly available and their use by Verizon is fully documented in the Company's cost study filing.

Mr. Koch has mischaracterized my comparison of ICM with the costs underlying Verizon's existing retail rates by wrongly concluding that I excluded loops served by DLCs only to eliminate DLC investment in the comparison costs. This is not the

case. As stated in my rebuttal testimony and explained in response to IRCA data request 5.04(b), loops served by DLCs under ICM's 18 kf copper loop length restriction were excluded in order to mirror the population from which the sample loops in the initial study were drawn. Consequently, Mr. Koch's truncated analysis of ICM with the earlier study is meaningless. The complete analysis presented in my rebuttal testimony demonstrates that Mr. Koch's and Mr. Hendricks' conclusion that ICM models an overbuilt network is wrong.

Finally, Mr. Koch's continued criticism of ICM's modeled network remains unwarranted and is not based on any new evidence. Because the Commission's rules require that costs be modeled as if the service is being offered for the first time, ICM's copper loop length restriction must be no more than 18kf in order to comply with the Revised Resistance Design standard used to design loops on a wire-center wide basis. Mr. Koch's assertion that ICM models the wrong DLCs is likewise unsupported. He overlooks the fact that the DLCs modeled by ICM are being purchased by Verizon for use in its network today and that the "traditional" SLC-96 DLC that he recommends is no longer manufactured. Mr. Koch also overlooks the fact that the GR 303 interface provided by ICM's modeled DLCs is more efficient because it allows for greater concentration on the DS-1 links that connect the DLCs to the central office.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MR. ZOLNIEREK'S OTHER CRITICISMS OF ICM.**

A. Mr. Zolnierek is incorrect when he claims that my rebuttal testimony is inconsistent. In making this claim, Mr. Zolnierek has equated the network modeled by ICM with a specific technology. The network modeled by ICM only utilizes technology that Verizon deploys today. There is nothing inconsistent between this and ICM's exclusion of SS7 Gateways on the grounds that the technology is not deployed and that there are no plans to deploy it.

Mr. Zolnierek is also incorrect when he claims that ICM is not company-specific. ICM is based on Verizon-specific material and placement costs, Verizon-specific expense inputs, and on Verizon's actual wire center locations, line counts and switch types -- ICM is clearly company-specific.

ICM's use of two network configurations for UNEs and for switched access LRSICs is not inconsistent as Mr. Zolnierek claims. The network modeled for UNEs reflects the fact that it is not possible to unbundle a loop using an IDLC configuration. Conversely, the network modeled for switched access LRSICs reflects the provisioning of loops to end users receiving or initiating the calls underlying the switched access services. Moreover, the two networks assumed by ICM understate both the cost of unbundled loops and the trunk port LRSICs because they avoid costly copper facilities for unbundled loops, and because they overstate the

utilization of central office terminals and DS-1 ports.

Mr. Zolnierek has proffered an unreasonable standard for openness and flexibility by suggesting that all possible modifications to ICM be achievable through input changes only.

Finally, Mr. Zolnierek's concerns about over- or under-recovery of costs are misplaced. Verizon's forward-looking, economic costs do not necessarily correspond to actual costs either individually or in the aggregate. Nevertheless, because SCIS and CostMod reflect how switches are actually engineered and because the line, trunk and usage inputs are based on Verizon's actual Illinois network, ICM produces the best available estimates of Verizon's forward-looking switching costs.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MS. MARSHALL'S OTHER CRITICISMS OF ICM.**

A. Contrary to Ms. Marshall's testimony, ICM does comply with the Commission's rules for cost studies. Instead of offering new evidence on this issue, she takes exception to ICM's use of the C. A. Turner indices to calculate the reproduction cost of Verizon's general support assets. Instead of the reproduction cost, Ms. Marshall would base the carrying costs of these assets on their historical, embedded costs, which is contrary to Part 791.20(c) of the Commission's rules. Ms. Marshall also

ignores the fact that ICM assumes all of the merger savings were realized at the close of the merger transaction and that the modeled expenses do not account for any inflation that has occurred since 1999.

Ms. Marshall is incorrect when she says that the demand data underlying ICM need not match the 1999 ARMIS data upon which ICM's modeled expenses are based. It is clearly incorrect to base modeled operating expenses on a network of 971 thousand access lines and to then calculate unit costs on a much larger or smaller network. Contrary to Ms. Marshall claims, Verizon New York only used a 10-year forecast to size distribution and feeder cable -- per-unit costs were not based on a 10-year demand forecast.

If the Commission adopts Ms. Marshall's recommendation that 100 percent of the merger savings be reflected in costs, then the portion that is to accrue to the Company must be reflected by increasing the fixed allocator. Moreover, such an increase in the allocator should not be confused with an increase in the amount of common costs modeled by ICM – it only reflects a different means of recognizing Verizon's share of the merger savings.

Contrary to Ms. Marshall's claims, ICM's modeling of shared costs does not create an opportunity for double recovery since, for example, a given loop can only be used to serve one end-user at a time. Also, the calibration adjustment I presented in my rebuttal testimony is responsive to and consistent with Ms. Marshall's requirement

that any change in the amount of direct costs, including shared costs, modeled by ICM be reflected in the calculation of the fixed allocator.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MS. BUCKLEY'S CRITICISMS OF ICM.**

A. Ms. Buckley repeated assertion that modifying ICM's inputs is difficult is not supported by any new evidence and is contrary to fact. Moreover, her criticism that ICM is subject to misuse because its inputs can be easily modified is inconsistent with both her assertion that modifying the inputs is difficult and with her desire for easily modified inputs. Nevertheless, Ms. Buckley is correct when she concludes that ICM is flexible, that nearly all of the decision rules and assumptions that drive decision rules within the model are user adjustable, and that users can make changes without difficulty.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MR. HENDRICKS' OTHER CRITICISMS OF ICM.**

A. Mr. Hendricks' comparison of ICM's costs with those produced in ICC Docket No. 97-0515 is flawed and should be ignored by the Commission. Once the flaws in Mr. Hendricks' comparison are corrected, the difference between the two sets of costs falls by more than half. Moreover, the difference that remains reflects ICM's improved modeling of customer dispersion, its recognition of discrete cable sizes, and its improved modeling of underground plant.

Mr. Hendricks has mischaracterized my comparison of ICM's modeled investment with the reproduction cost of the existing network. I have not proposed that Verizon's cost be based on reproduction costs as Mr. Hendricks claims. I merely have offered the reproduction cost of the network as a benchmark against which to gauge the reasonableness of ICM's modeled investment. Because the modeled investment is very close to the existing network's reproduction cost, the charge that ICM models an overbuilt network is unsupported.

Mr. Hendricks has wrongly concluded that my rebuttal testimony supports his claim that CLECs would be precluded from using UNE loops to compete with Verizon. To the contrary, my rebuttal testimony demonstrated that the differences between ICM's costs and the costs underlying the current retail rates are not due to the network modeled by ICM, but instead result from the improved assignment of operating expenses among the various network elements, from the differences in the composition of wire centers, and from the sampling methodology underlying the earlier set of costs.

Mr. Hendricks has not demonstrated that ICM's modeling of customer locations is inaccurate, nor has he offered a viable alternative to the approach taken by ICM. In particular, his suggestion that costs be based on a sample of average loop lengths is deficient because he has not explained how such a sample could be incorporated in ICM. Indeed, his responses to Verizon's data requests on this topic indicate that he

has not sufficiently reviewed ICM to achieve a basic understanding of the model's methodology. More important, costing methodologies that rely only on average loop length, or even on the distribution of loop lengths within each wire center, are inferior to ICM's approach since they cannot account for the impact of customer dispersion on costs. Because ICM's modeled sheath feet is below that found in the existing network, it is clear that ICM's customer location inputs have not resulted in too much local loop plant in ICM's modeled network.

**Q. PLEASE SUMMARIZE THE PORTION OF YOUR SURREBUTTAL TESTIMONY DEALING WITH MR. BOYLES' OTHER CRITICISMS OF ICM.**

A. Mr. Boyles has narrowed his claim that Verizon's existing engineering practices and network characteristics are inefficient to just his allegation that ICM's modeled switches are too large compared to their capacity. Mr. Boyles has again ignored the fact that digital switches are scaleable and that the line capacities he cites are only the upper limits on the number of lines each switch type can serve. Moreover, Mr. Boyles' suggestion that Verizon model switch types based on the minimum cost per line is nonsensical and has no basis in reality. If replacing existing switches in response to changes in relative prices were an efficient practice, we would see airlines switching their entire fleet between Boeing and Airbus depending on which manufacturer offered the lowest price for a single plane.

Mr. Boyles has also narrowed his claim that ICM is not flexible to the single issue of updating ICM's switching inputs. In reiterating this complaint, he has ignored the fact that SCIS-MO will write its output to a text file and has not commented on his ability to extract the required information from such a file.

Mr. Boyles is wrong when he says that Verizon could have avoided creating and filing PDF files since, even if the underlying Excel spreadsheets were filed, the PDF files are needed to prevent confusion caused by differences in printers or by changes to the spreadsheets. Moreover, Mr. Boyles has not claimed that his analysis of ICM has been hindered because only the PDF files were provided, nor does the scope of his testimony suggest that it was.

Mr. Boyles has not supported his claim that switch prices are falling – he has only shown that they have fallen since digital switches were first introduced in Verizon's Illinois network. Even if Mr. Boyles could establish that switch prices were falling and would continue to decline, it would be incorrect to incorporate this information into ICM's cost estimates without also updating the prices of all of the other resources used to operate the network. In any event, ICM's use of a mix of the pricing for additions and initial switch placements understates the current cost of switching resources.

Contrary to the claim made in his rebuttal testimony, Mr. Boyles has not relied on the best available evidence to support his recommended change to ICM's EF&I factor.

Mr. Boyles' proposed adjustment was based only on an ALJ's recommended order. Since then, but prior to the filing of Mr. Boyles' rebuttal testimony, the New York PSC has issued its final order which left Verizon New York's EF&I input virtually unchanged. Mr. Boyles has not only ignored this order, he has also wrongly claimed that ICM's EF&I inputs are based on historical costs. They are not – they are based on current labor costs and on the same forward-looking switch investments used to develop ICM's IAF inputs and switch discounts. Further, it would be incorrect to base ICM's EF&I inputs for Illinois on the New York order, since there is no reason to believe that EF&I costs in the two states would be the same, due to differences in the mix of switch sizes and types.

Mr. Boyles' rebuttal testimony does not support his proposed adjustment to ICM's call setup investments. His rebuttal testimony also does not repeat his claim that all sales, marketing and advertising expenses be removed from ICM's switched access costs, nor does he offer any new evidence supporting his adjustments to ICM's switch investments and IAF input. Likewise, Mr. Boyles is incorrect when he says that differences between Verizon's network and the model clusters used to develop ICM's switch discount undermine the foundation of Verizon's switching costs. The Commission should disregard Mr. Boyles' testimony on all of these issues.

Finally, Mr. Boyles maintains that Verizon should model switching costs as if the GTD-5 switches were replaced, but states that he does not expect Verizon to replace the switches in the real world. Not only does this position not make sense, it also

ignores the question of whether the modeled switch prices for the substitute switches could actually be obtained. Even though Mr. Boyles claims this proposal is intended to make ICM's switching costs forward-looking and efficient, it is clear that no efficient carrier would ever replace all or most of its switches because of change in the relative prices among vendors. If anything, an efficient carrier would base switching costs and prices on the cost of making additions to its existing network.

**Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?**

A. Yes, it does.